



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

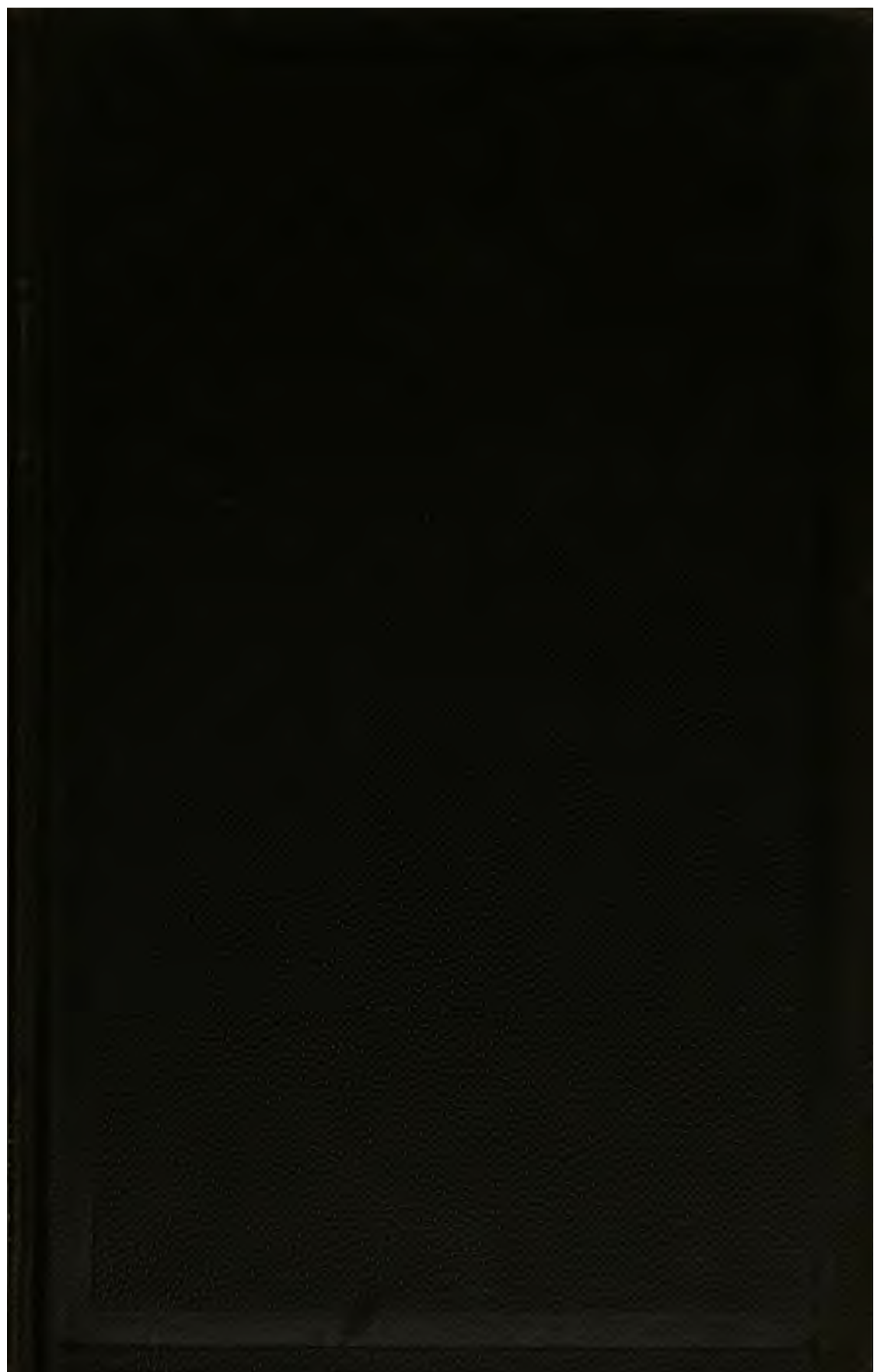
We also ask that you:

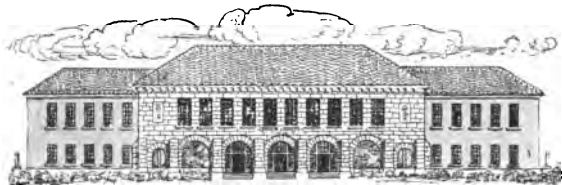
- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

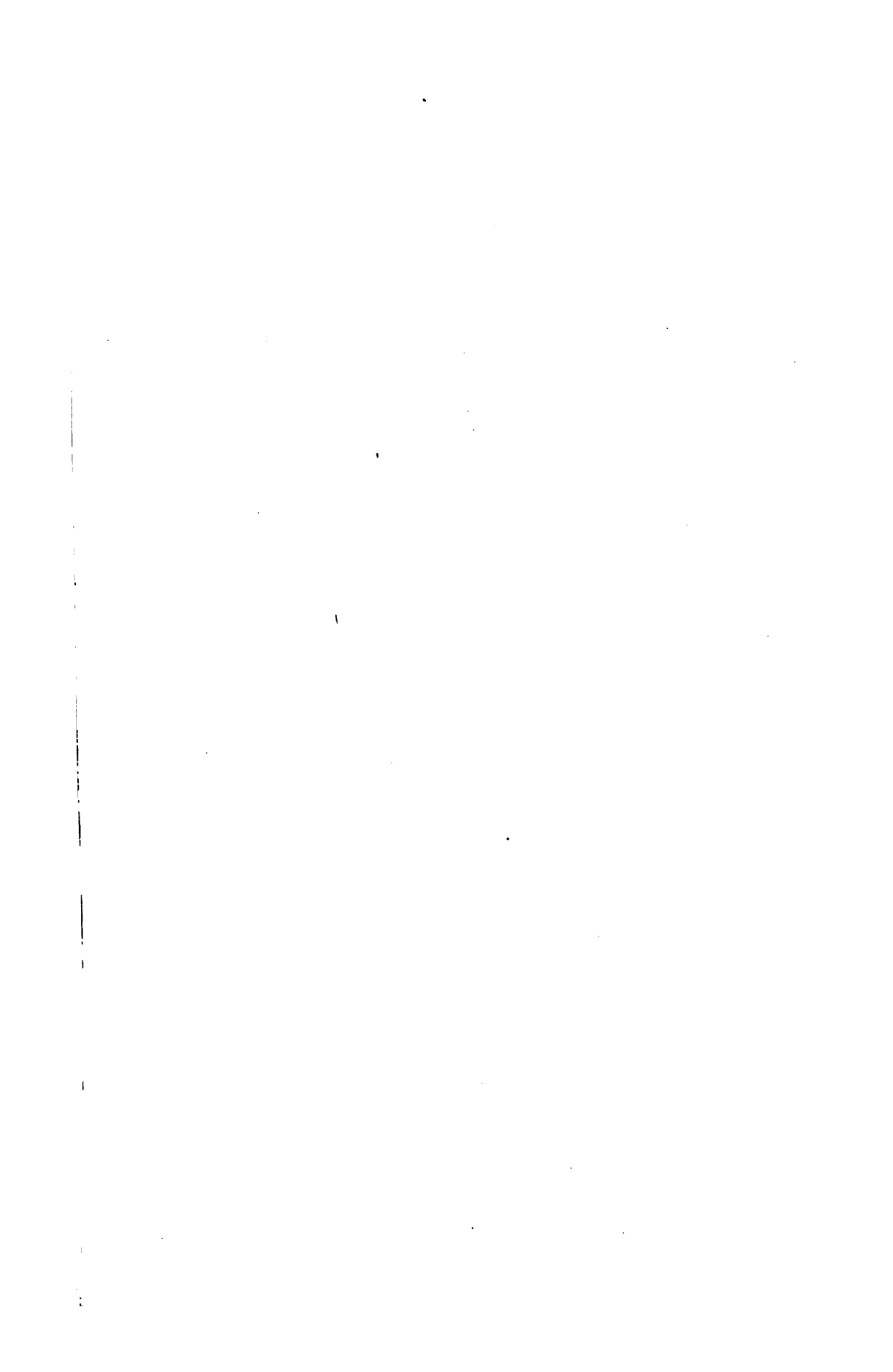






SCHOOL OF EDUCATION

COBBERLEY LIBRARY



PROCEEDINGS

OF THE

NINETEENTH MEETING

OF THE

UNIVERSITY CONVOCATION

OF THE

STATE OF NEW YORK,

HELD JULY 12--14, 1881.

BEING A PART OF THE 95TH ANNUAL REPORT OF THE REGENTS OF THE UNIVERSITY.

COPPERLEY LIBRARY

ALBANY :

WEED, PARSONS AND COMPANY, PRINTERS.

1883.

C

CONTENTS.

1. Sketch of the origin, objects and plan of the University Convocation (reprinted from former years) ..	3
2. Minutes of the Nineteenth Convocation, held July 12th, 13th and 14th, 1881	7
3. Registered Members of the Convocation of 1881	12
4. Chancellor Pierson's Address	15
5. Report of the Executive Committee, by Warden Robert B. Fairbairn, D. D., LL. D.	19
6. Mathematical teaching in academies, by Professor Truman H. Safford, Ph. D., of Williams College.....	22
7. Why should the Classics be studied? by Principal Ezra J. Peck, A. M., of Homer Academy	29
8. The Ideal Convocation, by Principal George R. Cutting, A. M., of Waterville Union School.....	38
9. Palæontological Evidences, as bearing upon the theory of Evolution, by Professor Henry S. Williams, Ph. D., of Cornell University	43
10. College Discipline, by Brother Anthony, President of Manhattan College.....	52
11. Education in Small Colleges, by Warden Robert B. Fairbairn, D. D., LL. D., of St. Stephen's College.....	57
12. Honor Studies in the University of Rochester, by Professor J. H. Gilmore, A. M.	71
13. A Basis of Methods of Teaching, by Principal William J. Milne, Ph. D., LL. D., of Genesee Normal School	77
14. The Recitation-room in its Relations to College Discipline, by Professor Henry Allyn Frink, Ph. D., of Hamilton College,	85
15. Recent Physical Theories in their bearing on the Teleological Argument for the Existence of God, by Professor Benjamin N. Martin, D. D., L. H. D., of the University of the City of New York	93
16. Normal Instruction in Colleges by Professor Edward North, L. H. D., of Hamilton College	114
17. Latin Etymology, by Professor Frank Smalley, A. M., of Syracuse University.....	117
18. Modern Agnosticism considered in reference to its Philosophical Basis, by Professor William D. Wilson, D. D., LL. D., L. H. D., of Cornell University	125
<i>University Necrology.</i> —Memorial of Chancellor Erastus Cornelius Benedict, LL. D., by Hon. George F. Betts, of New York city	
Joseph Raymond Dixon, by Principal E. J. Peck, A. M.	147
Principal George H. Taylor, A. M., of Amsterdam Academy, by C. W. Bardeen	154
Vice Chancellor Clinton's Address.....	156

THE UNIVERSITY CONVOCATION

OF THE

STATE OF NEW YORK.

I. SKETCH OF ITS ORIGIN, OBJECTS AND PLAN.

[Reprinted from the Proceedings of former years, by direction of the Convocation.]

At a meeting of the Regents of the University, held on the 9th day of January, 1863, the reports of colleges and academies, and their mutual relations, being under consideration, the following resolution was unanimously adopted:

Resolved, That it is expedient to hold annually, under the direction of this Board, a meeting of officers of colleges and academies, and that a committee be appointed to draft a programme of business for the proposed meetings, to fix the time and place, and to make such other arrangements as they may deem necessary.

The committee of arrangements on the part of the Regents were Chancellor Pruyn, Governor Seymour, Mr. Benedict, Mr. Hawley, Mr. Clinton, Mr. Perkins and Secretary Woolworth.

The meeting was held according to appointment, on the 4th and 5th days of August, 1863. Chancellor Pruyn briefly stated the objects entertained by the Regents, which were mainly "to consider the mutual relations of colleges and academies, and to promote, as largely as possible, the cause of liberal education in our State. While it is a part of the duty of the Regents of the University to visit the fourteen* literary colleges, and more than two hundred academies subject to their supervision, it is obvious that this cannot be done as frequently as desirable, and that some such method as is now proposed, whereby teachers may compare views with each other, and with the Regents, and discuss methods of instruction and general modes of procedure, is alike practicable and necessary.

* Now twenty-three (1881).

"A law enacted more than three-fourths of a century ago was cited, by which the University was organized and clothed with powers similar to those held by the Universities of Cambridge and Oxford, in England.

"The University of the State of New York, though generally regarded as a legal fiction, is, in truth, a grand reality. The numerous institutions of which it is composed, are not, indeed, as in England, crowded into a single city, but are scattered for popular convenience, over the entire State. It is hoped that the present meeting will more fully develop this fact, in accordance with which the officers of colleges and academics now convened are cordially welcomed as members of a great State University. It is also confidently expected that the deliberations now inaugurated will result in the more intimate alliance and co-operation of the various institutions holding chartered rights under the Regents of the University."

The Chancellor and Secretary of the Regents were, on motion, duly elected presiding and recording officers of the meeting. A committee, subsequently made permanent for the year and designated as the executive committee, was appointed by the Chancellor to prepare an order of proceedings. Among other recommendations of the committee, the following were submitted and unanimously adopted :

The Regents of the University of this State have called the present meeting of the officers of the colleges and academics subject to their visitation, for the purpose of mutual consultation respecting the cause of education, especially in the higher departments. It becomes a question of interest whether this convention shall assume a permanent form and meet at stated intervals, either annually, biennially or triennially. In the opinion of the committee, it seems eminently desirable that the Regents and the instructors in the colleges and academics should thus meet, with reference to the attainment of the following objects :

1st. To secure a better acquaintance among those engaged in these departments of instruction, with each other and with the Regents.

2d. To secure an interchange of opinions on the best methods of instruction in both colleges and academics ; and, as a consequence,

3d. To advance the standard of education throughout the State.

4th. To adopt such common rules as may seem best fitted to promote the harmonious workings of the State system of education.

5th. To consult and co-operate with the Regents in devising and executing such plans of education as the advanced state of the population may demand.

6th. To exert a direct influence upon the people and the Legislature of the State, personally and through the press, so as to secure such an appreciation of a thorough system of education, together with such pecuniary aid and legislative enactments, as will place the institutions here represented in a position worthy of the population and resources of the State.

And for the attainment of these objects, the committee recommend the adoption of the following resolutions :

Resolved, That this meeting of officers of colleges and academies be hereafter known and designated as "The University Convocation of the State of New York."

Resolved, That the members of this Convocation shall embrace,

1. The members of the Board of Regents.
2. All instructors in colleges, normal schools, academies and higher departments of public schools that are subject to the visitation of the Regents, and (by amendment of 1868) the trustees of all such institutions.

3. The president, vice-president, and the recording and corresponding secretaries of the New York State Teachers' Association.

Resolved, That the Chancellor and Secretary of the Board of Regents shall act severally as the presiding officer and permanent secretary of the Convocation.

Resolved, That the meeting of this Convocation shall be held annually, in the city of Albany, on the first Tuesday in August [see amendment], at 10 o'clock, A. M., unless otherwise appointed by the Board of Regents. [Amended in 1873, as to the time of meeting, by making it the first Tuesday after the Fourth of July, except when the Fourth occurs on Monday, in which case it shall be the second Tuesday thereafter.]

Resolved, That at each annual convocation the Chancellor shall announce the appointment, by the Regents, of an executive committee of seven members, who shall meet during the recess of the Convocation, at such time and place as the Regents may direct, with authority to transact business connected with its general object.

At the fourth anniversary, held August 6th, 7th and 8th, 1867, it was

Resolved, That the Regents be requested to invite the attendance of representatives of colleges of other States at future anniversaries of the Convocation.

At the fifth anniversary, held August 4th, 5th and 6th, 1868, the following resolutions were unanimously adopted :

Resolved, That there be appointed by the Chancellor, at each annual meeting, a committee of necrology, to consist of three persons.

Resolved, That it shall be the duty of each member of the Convocation to notify the chairman of the committee of necrology of the decease of members occurring in their immediate neighborhood or circle of acquaintance, as an assistance to the preparation of their report.

Resolved, That the secretary publish, with the report of each year's proceedings, the original resolutions of 1863, as they are or may be from time to time amended, together with the two foregoing, as a means of better informing the members of the Convocation in regard to its nature and the purposes of its organization.

UNIVERSITY OF THE STATE OF NEW YORK.

AN ORDINANCE RELATIVE TO THE UNIVERSITY CONVOCAATION,

Passed April 11, 1879.

The Regents of the University of the State of New York declare and ordain as follows:

SECTION 1. The University Convocation hitherto existing, is hereby constituted and established as the Convocation of the University of the State of New York, and shall continue to be called and known by the style of "The University Convocation." It shall consist of such members of the Board of Regents of the University and such instructors, officers and trustees of the several colleges, academies and other seminaries subject to the visitation of the Regents and constituent members of the University, as shall at the time being attend. The purpose of the Convocation shall be to secure an interchange of opinions on the subject of education and of literature, science and art, and to advance their standard in this State; to harmonize the workings of the State system of education; and, by essays, treatises, discussions and resolutions, on subjects connected with literature, science and art and with the credit, interest and welfare of the University and the institutions composing it, to recommend to such institutions and to the Regents, for their consideration, such action as may be expedient and lawful.

§ 2. The Convocation shall meet in the city of Albany, at the Capitol, on the first Tuesday after the Fourth of July, except when the Fourth occurs on Monday, in which case it shall be the second Tuesday thereafter, or at such other time and place as may be directed by the Regents. A quorum shall consist of those present at any actual sitting of the Convocation. The Board of Regents shall always be in session during the meeting of the Convocation, with such recesses of the Regents and of the convocation as may be expedient. The Chancellor and Vice Chancellor and the Secretaries of the Regents shall be the presiding officers and Secretaries of the Convocation, with power to substitute others to perform their duties respectively, *pro tempore*, not longer than one day.

§ 3. At the time of the Convocation shall be held the annual Commencement of the University, and such degrees as may be ordered by the Regents shall be then publicly announced and conferred by the Chancellor, except when the Regents shall otherwise provide.

II. MINUTES OF THE NINETEENTH CONVOCATION, HELD JULY 12-14, 1881.

The sessions of the Nineteenth Convocation of the University of the State of New York were held in the former Senate Chamber in the New Capitol, in the city of Albany, beginning on Tuesday, July 12, 1882, at 10:30 A. M.

The following is a list of the addresses and papers, in the order of presentation:

TUESDAY, JULY 12, 10:30 A. M.

Opening Address. Henry R. Pierson, LL. D., Chancellor.

Report of the Executive Committee. Rev. R. B. Fairbairn, D. D., LL. D., Chairman.

I. National Education.

1. Relation of the General Government to the Education of the People. Charles A. Gardiner, A. B., LL. B., Albany Academy.

2. Discussion by Secretary Murray, Principals Lovell and Bradley, Trustee Waterbury, Professors Dean, and Bennett, and Regent Fitch.

AFTERNOON SESSION, 3:30 P. M.

II. Instruction in Academies.

1. Teaching Classics in Academies. Principal Ezra J. Peck, A. M., Homer Academy.

2. Teaching Mathematics in Academies. Professor T. H. Safford, Ph. D., Williams College.

3. Teaching Science in Academies.

4. Discussion by Principals Kirk, Clarke, White, Verrill and Cavert, and Dr. Wilson.

EVENING SESSION, 8:00 P. M.

III. Pedagogy.

1. Methods of Teaching. Principal W. J. Milne, Ph. D., LL. D., Geneseo Normal School.

2. Chairs of Pedagogy in Colleges. Professor Edward North, L. H. D., Hamilton College.

3. Discussion by Professors C. W. Bennett and S. G. Williams.

4. Latin Etymology. Professor Frank Smalley, Syracuse University.

WEDNESDAY, JULY 13, 10:00 A. M.

IV. College Education.

1. Education in Small Colleges. Warden R. B. Fairbairn, D. D., LL. D., St. Stephen's College.

2. Discussion on the comparative educational advantages in small and large colleges. C. W. Bardeen, Esq. Syracuse; Regent Upson and Principal Cavert.

3. Palæontology as bearing on the theory of evolution. Professor H. S. Williams, Ph. D., Cornell University.

4. Discussion by Professors Wilson, Hall, and Justin.

AFTERNOON SESSION, 3:30 P. M.

College Education — (Continued.)

5. Honor Studies in Rochester University. Professor J. H. Gilmore, A. M.

Discussion by Secretary Murray.

V. College Discipline.

1. Paper by Brother Anthony, Manhattan College.

2. The Relations of the Recitation Room to College Discipline. Professor Henry A. Frink, Ph. D., Hamilton College.

3. Discussion by Principals King, Clarke and Verrill, and Professors Justin and Hagan.

EVENING SESSION, 8:00 P. M.

VI. Instruction in Philosophy.

1. Study of Philosophy.

2. Modern Agnosticism considered in reference to its Philosophical basis. Professor W. D. Wilson, D. D., LL. D., L. H. D., Cornell University.

3. Recent scientific ideas in their bearing on Teleology. Professor Benjamin N. Martin, D. D., L. H. D., University of the City of New York.

4. Discussion by Principals White and Kirk.

THURSDAY, JULY 14, 10:00 A. M.

VII. The Convocation.

1. The Ideal Convocation. Principal G. R. Cutting, A. M., Waterville Union School.

2. Discussion by Principal Sherman Williams.

VIII. Necrology.

1. Report of Committee. Professor Edward North, L. H. D., Chairman.

2. Memorial of Chancellor E. C. Benedict, LL. D.; Hon. George F. Betts, New York. Additional remarks by Regent Leavenworth, Dr. Bradley, Hon. Erastus Brooks, Chancellor Pierson and Dr. B. N. Martin.

3. Memorial of Zenas Morse, ex-Principal of Hamilton Academy, by Professor Spear, Madison University; of Rev. Hiram Hunting-

ton Kellogg, ex-Principal of Clinton Young Ladies' Seminary; Prof. Farrand Northup Benedict, LL. D., ex-Assistant State Geologist; Rev. George Robert Rudd, ex-Principal of Auburn Female Academy; and Eli Thornton Mack, ex-Principal of Granville Academy; by Professor North: of Joseph Raymond Dixon, ex-Principal of Homer Academy, by Principal E. J. Peck, Homer Academy; of Samuel Harvey Taylor, Principal of Amsterdam Academy, by C. W. Bardeen, Syracuse.

Remarks by Regent Upson on the eminent character of these deceased members generally.

IX. Closing Exercises.

1. Oration. Vice-Chancellor George W. Clinton, LL. D.
2. Conferring Degrees: Honorary Degree of Doctor of Medicine, on the nomination of the Homœopathic State Medical Society:

Drs. Edwin Hurd, Rochester; Alonzo Spofford Ball, New York; Horace Marshfield Paine, Albany; Charles Taylor Harris, Syracuse.

Degree of Doctor of Medicine of University of State of New York, on examination under chapter 746, Laws of 1872, as certified by First Board of Medical Examiners:

Howard Simmons Paine, M. D., to whom was also awarded, by the same board, the Dr. John F. Gray prize of \$50, for superior excellence in passing such examination.

Honorary Degree of Doctor of Laws:

Martin Brewer Anderson, President of the University of Rochester, now the senior college president in the United States, for his eminent services to the cause of education during his presidency of twenty-eight years.

3. Announcement of Executive Committee for 1881-2: Prof. T. J. Backus, Vassar College, Chairman. Professor J. H. Gilmore, Rochester University; Principal W. J. Milne, Genesee Normal School; Principal G. R. Cutting, Waterville Union School; Principal C. H. Verrill, Delaware Literary Institute; Principal H. C. Kirk, Phelps Union and Classical School; Principal D. C. Farr, Glens Falls Academy.

4. Concluding remarks by the Chancellor and adjournment.

MISCELLANEOUS BUSINESS.

The following is a memorandum of the miscellaneous business transacted during the sessions of the Convocation:

1. Time of Meeting, and Membership.

On the motion of Principal Palmer, of the Fredonia Normal School:

Resolved, That the Chancellor be authorized to appoint a committee of seven to consider and report upon the expediency of

holding the Convocation at some other time of the year and of making membership to a greater extent representative—as suggested by the Chancellor in his opening address and by the Executive Committee in their report.

The Chancellor appointed as such committee: Drs. Palmer, Wilson, Bennett, Bradley, North, Upson and Clarke.

The committee subsequently reported by resolution, as follows:

1. *Resolved*, That the Board of Regents be requested to change the time of meeting of the Convocation to the Wednesday evening next after the second Thursday of January, each year.

2. *Resolved*, That without desiring to change the constitution of the organization, we recommend that institutions entitled to representation in the Convocation send delegates to its meetings.

On the motion of Warden Fairbairn, these resolutions were laid over to the next Convocation, and it was directed that a copy of the same be sent to each institution interested.

2. *National Education.*

At the close of the discussion of the paper read by Mr. C. A. Gardiner, on motion of Regent Fitch, it was unanimously

Resolved, That this Convocation will heartily favor and aid in all practical ways such proper measures as may be perfected by Congress for government aid to popular education, especially in the Southern States.

3. *Pedagogical Training in Colleges.*

In connection with the discussion of the papers read by Drs. Milne and North, on the motion of Dr. Bennett, it was

Resolved, That a committee of three be appointed by this Convocation to report at the next Convocation upon the expediency of supplying the felt need of pedagogical training to the students of the colleges of this State.

The Chancellor appointed as such committee, Professors Bennett, North and S. G. Williams.

4. *Attempted Assassination of President Garfield.*

On motion of Dr. Wilson, a committee of three was authorized to be appointed to consider so much of the Chancellor's opening address as relates to the recent attempted assassination of the President of the United States. The Chancellor appointed Dr. Wilson and Regents Fitch and Bostwick as such committee.

The committee subsequently reported the following resolutions, which were unanimously adopted:

1. That, in common with all good citizens of the Republic, we heard with profound sorrow of the assault upon the life of the President, and most earnestly deplore it, whether it was simply the outcome of an insane impulse on the part of its author, or may be associated either directly or indirectly with the imperfect conditions

and limitations that now obtain concerning the distribution of the Federal patronage. If from the latter cause, an emphatic argument is presented to an intelligent nation in favor such modifications of the existing system of the civil service as shall purify it of its abuses, and at last make it impossible that assassination shall, under any circumstances, suggest it as a solution of political problems.

2. That this Convocation desires, irrespective of his virtues as a Chief Magistrate, to make acknowledgment of the zeal he has manifested, and the services he has rendered in behalf of popular and higher education.

3. That we tender our most cordial sympathies to him and to the members of his family in his present enfeebled state, and trust that the encouraging symptoms now reported may prove the assurance of his speedy restoration to health and to the discharge of the duties of his high office.

4. That the Chancellor and Secretary of the Board of Regents of the University be requested respectfully to forward these resolutions, properly attested and engrossed, to the President.

5. *Resolution of Thanks to Judge Betts.*

After the reading of the Memorial of the late Chancellor Benedict by the Honorable George F. Betts, of New York, on motion of Dr. Bradley, it was

Resolved, That the thanks of the Convocation be presented to Judge Betts for his admirable tribute to Chancellor Benedict, and that the same be included in the proceedings of the Convocation.

6. *Publication of Opening and Closing Addresses.*

On motion of Warden Fairbairn :

Resolved, That the Regents be requested to publish at the earliest practicable day the opening address by the Chancellor and the closing address by the Vice-Chancellor.

NINETEENTH CONVOCATION OF THE UNIVERSITY OF THE STATE OF NEW YORK.

Permanent Officers, ex-officio. — Henry R. Pierson, LL. D., Chancellor; George W. Clinton, LL. D., Vice-Chancellor; David Murray, Ph. D., LL. D., Secretary; Daniel J. Pratt, Ph. D., Assistant Secretary.

Executive Committee for 1880-81. — Robert B. Fairbairn, LL. D., D.D., St. Stephen's College; Truman J. Backus, A. M., Vassar College; Francis B. Palmer, A. M., State Normal School, Fredonia; Merrill E. Gates, A. M., Ph. D., Albany Academy; Thomas B. Lovell, A. M., Attica Union School; John E. Myer, A. M., Plattsburgh High School; Sherman Williams, Flushing High School.

Committee on Necrology. — Edward North, L. H. D., Hamilton College, Clinton; Daniel S. Martin, A. M., Rutgers Female College, New York; Daniel J. Pratt, Ph. D., Albany.

REGISTERED MEMBERS OF THE CONVOCATION, 1881.

Board of Regents.

Henry R. Pierson, LL. D., Chancellor, Albany; George W. Clinton, LL. D., Vice-Chancellor, Buffalo; Neil Gilmour, Superintendent of Public Instruction, Albany; Elias W. Leavenworth, LL. D., Syracuse; Martin I. Townsend, LL. D., Troy; Anson J. Upson, D. D., LL. D., Auburn; William L. Bostwick, Ithaca; Charles E. Fitch, Rochester; Henry E. Turner, Lowville; David Murray, Ph. D., Secretary, Albany; Daniel J. Pratt, Ph. D., Assistant Secretary, Albany.

Colleges, etc.

Union College.—Prof. Geo. W. Dean, D. D.
 Albany Medical College.—Profs. Willis G. Tucker; Wm. Hailes, Jr.; F. C. Curtis; Lecturer, E. A. Bartlett.
 Dudley Observatory.—Director Lewis Boss.
 Hamilton College.—President-elect, Henry Darling, D.D., LL.D.; Professors Edward North, L. H. D.; Henry A. Frink, Ph. D.
 University of City of New York.—Prof. Benj. N. Martin, D. D. L. H. D.
 Rensselaer Polytechnic Institute.—Prof. James Hall, LL. D.
 Madison University.—Profs. P. B. Spear, D. D., John J. Lewis.
 University of Rochester.—Prof. J. H. Gilmore.
 St. Stephen's College.—Warden R. B. Fairbairn, D. D., LL. D.; Profs. Wm. W. Olssen, D. D., Geo. B. Hopson.
 Vassar College.—Profs. L. C. Cooley, Ph. D.; Truman J. Backus.
 Manhattan College.—Brother Anthony; Brother Justin; Prof. Edward F. Fagan.
 Cornell University.—Profs. Wm. D. Wilson, D. D., LL. D., L. H. D.; Samuel G. Williams, Ph. D.; Henry S. Williams, Ph. D.
 College of the City of New York.—Tutor Jas. E. Morrison.
 Rutgers Female College.—Prof. Daniel S. Martin, Ph. D.
 Syracuse University.—Profs. Chas. W. Bennett, D. D.; Frank Smalley.
 Williams College(Mass.)—Prof. Truman H. Safford.
 State Library.—Librarians Henry A. Homes, LL. D.; S. B. Griswold, Geo. R. Howell.
 State Museum of Natural History.—Director James Hall, LL.D.; Charles H. Peck.
 State Normal School, Albany.—Prof. Joseph S. St. John.
 Geneseo Normal and Training School.—Principal Wm. J. Milne, LL. D.
 Fredonia Normal and Training School.—Principal Francis B. Palmer, Ph. D.
 N. J. State Model School, Trenton.—Superintendent Oliver P. Steves.

N. Y. State Board of Charities.—Secretary Charles S. Hoyt, M. D.

N. Y. State Board of Health.—Hon. Erastus Brooks.

N. Y. State Entomologist.—J. A. Lintner.

N. Y. State (First) Board of Medical Examiners.—Horace M. Paine, M. D.

Academies, etc.

Albany Academy.—Trustee Edward P. Waterbury; Chas. A. Gardiner.

Albany High School.—Principal John E. Bradley, Ph. D.; William D. Goewey; Miss Mary Morgan.

Albany Public Schools.—Principals E. E. Packer, E. A. Corbin.

Amsterdam Academy.—Ex-Principal Wm. W. Thompson.

Attica Union School, Acad. Dept.—Trustee James H. Loomis; Principal Thos. B. Lovell.

Brewster Union School.—Miss Ella E. Covey.

Canandaigua Academy.—Principal Noah T. Clarke, Ph. D.

Cazenovia Seminary.—Ex-Principal W. S. Smyth; Aaron White.

Christian Brothers' Academy, Albany.—Brother Leontine; Brother Maurice

Claverack Academy and H. R. Institute.—Principal Alonzo Flack, Ph. D.; Wm. McAfee.

Clinton Liberal Institute, Fort Plain.—Principal C. V. Parsell; W. R. Haig.

Delaware Literary Institute.—Trustee Samuel F. Miller; Principal Chas. H. Verrill, Ph. D.

Egberts High School.—Principal Andrew J. Robb.

Flushing High School.—Principal Sherman Williams.

Fort Edward Collegiate Institute.—Principal Jos. E. King, D. D., Ph. D.

Glens Falls Academy.—Principal Daniel C. Farr.

Hartwick Seminary.—Trustee Irving Magee, D. D.

Homer Union School, Acad. Dept.—Principal Ezra J. Peck.

Houghton Seminary, Clinton.—Principal Asa G. Benedict.

Hungerford Collegiate Institute.—Principal Albert B. Watkins, Ph. D.

Jersey City (N. J.), High School.—Principal Geo. H. Barton.

Johnstown Union School, Acad. Dept.—Principal Wm. S. Snyder.

Lansingburgh Academy.—Principal Chas. T. R. Smith.

Mechanicville Academy.—Mrs. S. E. K. Ames.

Munro Collegiate Institute.—Principal Truman K. Wright.

Oneonta Union School, Acad. Dept.—Principal Nathaniel N. Bull.

Phelps Union and Classical School.—Principal Hyland C. Kirk.

Phoenix Union School, Acad. Dept.—Principal B. G. Clapp.

Rensselaerville Academy.—Principal Benj. F. Eaton.

- Rockland Academy, Nyack.— W. H. Bannister.
 Sandy Creek Union School, Acad. Dept.— Principal J. Edman Massee.
 Saratoga Springs Union School, Acad. Dept.— Principal Levi S. Packard.
 Sauquoit Academy.— Principal T. H. Roberts.
 Schoharie Union School, Acad. Dept.— Principal Solomon Sias.
 Seymour Smith Academy.— Principal Abraham Mattice.
 St. Mary's Academy, Troy.— Brother Favian; Brother Lewis.
 Sherman Academy, Moriah.— Preceptress E. Sophia Winter.
 Sodus Academy.— Principal Elisha Curtiss.
 Troy High School.— Superintendent David Beattie; Principal Henry A. Pierce; Harry P. Judson.
 Unadilla Academy.— Principal Emmett Belknap.
 Waterford Union School, Acad. Dept.— Principal E. E. Ashley.
 Watertown High School.— Principal Wm. K. Wickes.
 Waterville Union School, Acad. Dept.— Principal George R. Cutting.
 Waverly Union School, Acad. Dept.— Principal Henry H. Hutton.
 Weedsport Union School, Acad. Dept.— Principal D. D. Van Allen.

Rev. Walton W. Battershall, D. D., Albany.
 Rev. Thaddeus A. Snively, Troy.
 Philander Denning, Esq., Albany.
 Walter B. Moore, Esq., East Aurora.
 John Thompson, Albany.
 Miss Margaret F. Morgan, Albany.
 Seward M. Dodge, Milford.
 W. W. St. John, Greenbush.
 Hon. Russell M. Tuttle, Hornellsville.
 T. D. Worden, M. D., Albany.
 Patrick Henry Cummings.
 F. Demers, Troy.
 Geo. L. Stedman, Esq., Albany.
 Thos. S. Lambert, M. D., New York.
 Hon. Wm. W. Niles.
 Jonathan Tenney, Ph. D., Albany.
 Samuel D. Barr, Cleveland, O.
 Michael P. Cavert, Rhinebeck.
 Rev. Albert F. Lyle, Ilion.
 Frank S. Smith, Esq., Angelica.

CHANCELLOR PIERSON'S ADDRESS.

On calling the Convocation to order, Chancellor Pierson delivered the following address :

Gentlemen, Members of the Convocation : In behalf of the Board of Regents of the University of the State of New York, I welcome you to this, its nineteenth convocation. Nor is this welcome any formal greeting, but we look to this meeting with profound interest, and we have invoked your presence, that our own work may be stimulated and perfected, by what you shall approve and do.

This convocation differs from all ordinary educational conventions which are held in the State. It is to us more personal and responsible. You come together, persons connected with the various institutions under the care of the Regents of the State. You come that we may consult with, and be advised by you, touching matters of mutual interest. We desire your aid, your judgment, your criticism. We wish to report to you the educational work we have had in progress during the year that has passed ; how much we have accomplished ; what have been our methods ; wherein have been found difficulties, and to seek what remedies shall be best applied for their removal. It is only at meetings like this that we fairly present, or discuss the duties, the responsibilities, and the purposes of the Board of Regents.

Let me enumerate some of these educational matters that give us thought for plan and purpose. We are charged with the duty of receiving reports and to some extent looking after the work and progress of twenty-two colleges, institutions created by the State, having the privilege of conferring degrees. Thirteen of these colleges are exclusively for the education of males, five are exclusively for the education of females, and four admit both sexes.

To these colleges are committed most especially the work of higher education of the State. Their course of study, their libraries, their apparatus, the work they accomplish, are all matters of the first importance to us, and to a certain extent reflect our efficiency. It appears from the reports of these colleges that most of them are small institutions. It will be a fair subject for discussion whether the interests of higher education are better subserved by a few large colleges, and whether these many smaller colleges should be stimulated and encouraged. In the former there is a great economy of teaching force, but in the latter education is brought nearer to the many communities and thus not only more cheaply diffused, but possibly stimulated. We invoke your judgment upon this matter ; it is important. Besides literary colleges, there are about twenty medical colleges in the State that report to us.

By a recent law of the State no person can now be admitted to practice medicine, unless he has a diploma from a legally organized and maintained medical college. Hence, these institutions form a

most important part of the University, and their growth, policy and plans of study, are matters of great educational interest.

During the past year the regents have issued no new college charters and none are known to have been issued by the Legislature, or by the Supreme Court ; bodies having concurrent powers for that purpose. It may seem indecorous for us to make the suggestion, but we submit for fair consideration, whether it is likely to conserve the public good, or promote well conducted college work that so many bodies may be approached for charters and if it would not be safer that such power of granting charters, and amendments thereto should be confined exclusively to the Board of Regents, or at least to some one of these bodies to the exclusion of the other.

Academies.— There are two classes of academies under our supervision and visitation. As will be seen by our last report to the legislature, ninety-three of these are incorporated academies supported by private resources, derived either from endowments, subscriptions or fees for tuition, and 189 are free academies, forming the academic department of the public schools, and supported by taxation, thus making in all a total of 252.

Of these two classes, the latter are largely in the increase, both from the organization of new academical departments, and by the adoption of incorporations as free academies in accordance with law. We might pause here and ask you to consider how far it is the duty of the State to support these academic departments, by general taxation — in other words, where the duty of the State in support of educational institutions ends, and that of the parent or guardian begins ; a question of vast import, about which there may be, and is much diversity of opinion.

The Regents come in contact with these academies in several ways.

First. They are required to make to us annual reports of their financial and educational condition. During the year that has passed the form of these reports has been revised, and, as far as possible, so modified as to be adapted to the condition of the schools.

Second. The income of the literature fund, amounting annually to \$40,000, is distributed in proportion to the number of academic scholars. In the past there was much laxity and consequent complaint in ascertaining the true and proper basis for the distribution of this fund ; hence the regents, for the purpose of making a fair and impartial test, established preliminary examinations, thus fairly ascertaining who shall be counted in the distribution. Last year the number of academic scholars was about 8,400 ; the pro rata amount per head distributed, \$4.77.

The work of carrying on this examination has grown to enormous proportions. Since 1866 about 56,000 have been examined and passed — about 5,000 in each of the years 1879, '80 and '81. At the last June examination the papers used exceeded 40,000.

Third. The advanced examinations were designed originally for furnishing a uniform standard of academic scholarship. They have, it is believed, done much in this direction. They were begun in

1878, and the board certify with pleasure to the zeal and interests with which this work has been supplemented by the board of instruction and those having care of these schools. More than 4,000 candidates are now going through these examinations. The regents have issued, during the past year, 141 academic diplomas and 255 certificates of progress, otherwise known as intermediate certificates.

The legislature of 1880 gave the board authority to distribute a part of the literature fund, on the basis of the number passing the advanced examination. This is done by paying to the academies certain fixed sums for each candidate carried through the course.

The Regents' examination, based upon the college entrance studies, is now recognized and accepted by a number of the colleges, as evidence of preparation for admission to such colleges, and it is believed that, in reality, it furnishes a better evidence for such preparation than any tests that are ordinarily applied at the time of entrance. For that purpose, and to promote the best possible fundamental education, the board have conducted these examinations with the utmost care, both in the preparation of the written questions and in the methods by which such examinations are conducted, and which, it is not claimed, have attained perfection. We submit for your judgment, if we have not cause for congratulation, and ask such suggestions as may be proper.

Another very important part of our work, imposed by law, is the instruction of teachers for the common schools. By far the greater part of these teachers are prepared in the academies at special sessions, where are organized what is known as teachers' classes. The State appropriates \$30,000, annually, to be paid for this service, and this sum is divided among the academies in proportion to the number of teachers taught. For two years, there has been a partial failure of the means to maintain this service properly, but we are happy to advise you, that the present legislature has made permanent provision, and the future of the work is secured.

But it is fair to say to you that the board has not been, and is not now, satisfied with the character of this work and the manner of its performance, and they have been exceedingly anxious to improve it and to give it more personal attention and supervision. To this end they will be glad to have the system discussed by the Convocation, and will receive with thanks any suggestion looking to its improvement.

Finally, the Board of Regents are exceedingly anxious that the convocation itself, in its organization and administration, should be stimulated to its utmost degree of usefulness.

It is a serious question whether it fully realizes its mission.

It is difficult to bring together a full representation of the educational interests of the State.

It will be the consummation of our full ideas of this convocation, when each college and academy shall be fully represented by its delegates, and the various subjects of mutual interest fully discussed.

In no better way can the great duty of higher education, of which we are the conservators, be so well discharged.

I have a strong impression that our efficiency would be promoted by restricting our programme, not only within narrow limits, but also to subjects of common interest to the institutions connected in our University. New York has a system of higher and secondary education which is unique. This peculiarity of organization gives a unity to our interests and to our administration, which makes peculiarly appropriate a common gathering like this with full and interested representations.

It has been suggested that the winter season would be better than the summer for our time of meeting. In the summer, plans for vacations, summer travel or extra summer schools are broken in upon by the Convocation. Your opinion upon this point will be heeded.

Gentlemen of the Convocation : I cannot close this brief review of our work without referring to that great shadow that has fallen upon our fair land in the attempted assassination of our chief executive, the honored President of the United States.

It has given us many lessons ; some that may not yet be fully discussed ; but there comes to me to-day a profound impression, that this event shows that there is a great lack in the education of our people.

Education in this country is, and of right should be largely governmental. It is of supreme importance in a government like ours, that the people should be intelligent, well advised, capable of self-restraint, thoroughly informed, not only as to the right of the governor and the governed, but also as to what duties are due to the State and its constituted representatives ; what personal responsibilities attach to the enjoyment of such exalted privileges as are given to a free people. I submit for your consideration if, after all, the safety of the Republic must not be found in the education of the masses.

Is that idea held as it should be by those who are engaged in the work of education ? Is it not true, that in many, yes most, of our schools, the great questions of political science and political economy are either not taught at all, or else made subordinate to other studies, which, while they are important elements of education, yet do not lead to that independent and intelligent manhood, that makes men. The growth of power, the immense and rapid increase of the public wealth, the vast distribution of patronage, the rapid development of the national interests are so stimulating, if not intoxicating, that it is hard to keep up the supply of an advanced dignified manhood to lead and direct them. Where shall this be looked for, if not from those who have the training of the youth in our academies and colleges. Should not every boy be taught what government is, that he may respect and obey it ; what power and place is, that he may understand and adorn it ; what it is to represent a constituency and what duties it involves, that he may feel that he owes more to it than to himself, if he accepts a representation ; what public wealth is, how obtained, how preserved and promoted, to the end that he may be useful as well as ornamental.

Can we not do something more to educate intelligent American manhood, and thereby do something to save the State from such disgraceful, and disheartening acts as that which now paralyzes the great heart of our people. I pray that God will save the Republic, that he will give us the will and the way to do our whole duty as its favored children.

REPORT OF THE EXECUTIVE COMMITTEE.

REV. R. B. FAIRBAIRN, D. D., LL. D., Chairman.

MR. CHANCELLOR — At the opening of the nineteenth University Convocation I beg leave to offer to you the congratulations of the executive committee, in which I am sure that the convocation will join with us. The relations in which we have all stood to the late Chancellor Pruyn and the late Chancellor Benedict, and which we remember to-day with so much pleasure on account of the kindly disposition and eminent character of those two distinguished gentlemen, are the relations which we know from our acquaintance with you as regent, that we shall maintain with you as our head and our presiding officer, and in all the duties which are involved in your office as Chancellor of the University of the State of New York. If feelings of sadness arise in our minds when we look back over the nineteen years in which this convocation has held its annual meetings, there are also feelings of satisfaction and pride which we have a right to entertain and to express. It is no slight honor to have been associated with such men as President Fisher and Chancellor Ferris, with Professor Davies and Professor Tayler Lewis, with Mr. Verplanck and Mr. Hawley, as well as with your two eminent predecessors and a host of others who, by their courtesy, their cultivation and their high character, have adorned these meetings, and will make them memorable in the history of the educational institutions of the State. It appertains to us who have succeeded to these eminent men to sustain the character of our institutions and the interest in this convocation. I have always held that one of its great benefits was that it brought together the educators of the State and made us acquainted with each other. I have learned in this convocation to respect and to honor men from whom I differed in opinion and in associations of life. It would be impossible that this should not be one of its results, when the men of the character and the attainments to whom the colleges and academies of the State are intrusted come together, as we do under the authority of the Regents of the University. We are sure that we shall have your support and your sympathy; we have no misgivings that the convocation will maintain its character, and that under your guidance it will continue to exert the influence which has marked it from the beginning.

I have been led to make these remarks because the committee present to you to-day a programme somewhat different from that

which has been presented to the previous convocations. That some change was desirable seems to have been a feeling rising in different quarters. It has arisen from no dissatisfaction with the past; we do not attempt a change to-day because we suppose that we can do better than those who have gone before us, but we present a different programme only because different times and different conditions of our institutions call for different means. It is impossible that the papers which have been read should have interested all who heard them, but that did not show that they were any the less able, and that they were not valuable contributions to our work. There have been papers presented here which have a permanent value. The published volumes of this convocation will exhibit a degree of culture and ability which will always be valued and honored. Possibly the only result of our change will be to make the doings of the convocation more practical. We shall afford more opportunity for an exchange of opinions. There will be more opportunity for consultation. We shall attempt to open the way by which we will be able to learn more from each other.

I have also made the attempt to bring together a larger number of the presidents and professors of our colleges. For this purpose, as soon as the opportunity was afforded me, I addressed a letter to the president of each college in the State, explaining our new programme and inviting their co-operation in the work of the convocation. I presented a number of questions which were suggested to me by one of the members of the convocation, and invited them to select one, or to suggest one of their own for the consideration of this convocation. I have received several responses to my letters approving the plan and congratulating the committee, but I am sorry to say that very few have offered assistance or have expressed a willingness to take part in our proceedings, or an intention to be present at our meeting. I have counted from the published proceedings of the regents the number of members of the various faculties of our colleges, and find it to be over three hundred; and yet the proceedings of this convocation do not reveal a greater number than thirty present at any one time. This is only one tenth of the whole number. With the active co-operation of all the colleges of the State we should give great interest and great importance to the proceedings of this body. We might make it a power and might exert an influence on the standard of education and on the discipline of the colleges which would be felt throughout the State. If we would meet each other and show our determination to co-operate in the purposes of education and of discipline, we should certainly see results which would be much greater than we have yet obtained.

It has been suggested that possibly the reason why so few attend our convocation is that it comes in the midst of warm weather, and at the beginning of the vacation, when every one feels the need of rest and recreation. There is, no doubt, a very great deal of truth in this, and the question therefore arises whether we cannot select

some other season of the year which would be much more convenient to the regents, the colleges and the academies. It has also been suggested, as this is in a large measure, as far as the colleges are concerned, a representative body, whether it could not be made more specifically such by having the convocation in the month of January, to correspond with the time of the regents' annual meeting, and then instead of expecting all the college presidents and professors, to look only for a representation from each college. I merely make this as a suggestion for the consideration of the convocation, to be called up at any future time if any one shall desire to do so.

You will see another feature in our programme, which is a classification of subjects. Each session will be confined to one subject. We shall not go from one subject to another, but we have endeavored to have one subject presented by different persons from different points of view, and then we shall give opportunity to any member of the convocation to express his views and opinions as far as he may be able to do so in a short speech of ten minutes, unless the convocation shall order otherwise. For this classification we are indebted to the interest the valued and able secretary of the regents has taken in our proceedings.

Hoping that this change may meet with your approbation and that of the convocation, and that it will give renewed interest to our meeting, it only remains for me to assure you that the executive committee will co-operate with you and with the convocation in every way in our power in carrying out its purposes, and in making this a convocation worthy of the University of the State of New York.

ON MATHEMATICAL TEACHING IN ACADEMIES.

Professor TRUMAN H. SAFFORD, Ph. D., of Williams College.

In presenting myself before you, ladies and gentleman, to discuss the subject assigned me, I do not propose to occupy the stand-point of the professional mathematician. I prefer rather to take that of the teacher ; for a long experience with many classes of pupils, and a wide observation of good teachers of several nationalities, has shown me how great is the diversity of views between instructors and investigators ; and this especially in mathematics.

With mathematical abstraction for its own sake I have but little sympathy. The mathematics is to all a most useful tool, just as essential in astronomy as the telescope, nay even more so ; but I should now have no delight in sitting down to the study of a speculative problem in the higher mathematics with no outlook whatever toward practical application in some other branch of science.

But on the other hand I feel strongly the need of a deeper cultivation in our country of the mathematics as a tool for scientific investigation. An eminent chemist came to us last year with the inquiry, how can I best acquire the mathematical knowledge which "my science begins to demand ?" I inferred from what he told me that almost a new branch of mathematics was needed for the study of the deeper *chemical* problems of the present day ; in other words that the present chemical thinking needs to be *mathematically formulated*.

There are in our present mathematics certain shadowy forms, intelligible to a few, and a few only. They are the mathematics of the imagination, far beyond the reach of students and of many professors. For my own part I do not find time to study them, except as they bear upon other investigations which have to do with sun, planets, comets and stars. My chemical friend would probably waste his time if he tried to enter this realm of shadows in search of what he desires ; he would probably do better to arrange the facts of chemistry by the help of the well-known principles of the differential and integral calculus.

My notion then is, that the mathematics of the schools must be *practical* mathematics. In the common schools, its material must be taken from common life ; in the practical academy, from the elements of natural science and of art as well as from common life ; in the college, from natural science and art as there studied.

Do not construe these words as excluding the ideal, even from the common school ; it is because I wish to see mathematics made *more* ideal, that I wish its study to be firmly grounded upon a basis of fact. The architects who built the *Parthenon*, or *Cologne cathedral*, took very good care that their foundations were solid. So too of all mental culture the foundation is always and everywhere a most important matter.

There are two ideal worlds ; the one conventional and imaginary, the other based upon reality, and as real as anything in the universe.

There are two forms of art : in the one conventionality rules, the other is based upon nature.

So too, there are two kinds of mathematical writings : the one set are imaginative, high, abstract, accessible to few, and possibly conventional ; the other directly based upon the natural sciences and the nature of the mind ; one side of it grew directly out of the fine arts ; and this part of mathematics is singularly beautiful to those even partly initiated, and is thoroughly practical in the highest sense.

Whenever I speak about teaching mathematics, the question at once comes up, who are to be the teachers, and what the text-books ?

To teach the mathematics well requires the best teachers. It requires long study of the matter taught, and the minds instructed. You have to train not only natural mathematicians, and this is one of the teacher's luxuries ; but to be patient, kind, appreciative toward those whose minds work more slowly, who say and think that "mathematics is not their *forte*," and are thoroughly discouraged with previous attempts to master it.

Now the old maxims of good teaching, that we must teach the *easy*, the *near*, the *concrete*, before we attempt the *difficult*, the *far distant*, the *abstract*, apply with immense force to this science. What is called "lack of mathematical talent" may mean one of two things ; either want of productive capacity, genius ; or of receptive capacity and power of applying the devices of other minds. I think the former is rare, the latter in *some degree* common to all sound minds. I know a cobbler, who cannot multiply, and have set him down as the worst educated man I know in spite of the excellence of his cobbling.

Now mathematics is made up of step-by-step reasoning. Before you can come to conclusions in it, you must have data, and there are often prior conclusions, which the mind has lost, often images of geometrical forms which it has never had.

It is said by teachers of the widest experience that no subject can be more certainly taught, if rightly taught, than mathematics, none in which the pupil is surer to come to the end in view, provided every step be properly taken, and not hurried ; none in which it is more important to keep ordinary life and the common phenomena of nature constantly in sight.

Let me say here, that I do not propose to criticise text-books or teachers, save as pointing out the line of improvement. But I do wish to say that I think our text-books, and so far as they are influenced by the books, our teachers attempt too much work in a short time. I have thought out a programme of study for the *average* ages of fourteen to eighteen, *i. e.*, while the boy or girl is preparing for college.

It should include arithmetic reviewed, with the elements of algebra and geometry orally taught, for the first year ; and for three (or

at least two) later years, a course of *both* algebra and geometry; to cover in two years elementary algebra to quadratics and about four books of geometry.

For a business education subjects will be farther developed practically; and I think a full course of business arithmetic should be added. Similarly, if there are pupils preparing for a polytechnic school, like the admirable institute at Troy, there should be other additions, and I should regard the whole programme as tentative only: but not to be *largely* extended within the time. The experienced teacher will possibly consider the programme a slow one. There is a certain impatience in American boys which leads them to desire new subjects and new books before they have thoroughly mastered the old; and to meet this objection and the corresponding invidious comparisons between schools will require great tact and skill on the teacher's part.

But I must explain in detail what I mean.

The first thing that will seem strange to some is the *oral* geometry and algebra. The beginning of geometry is the sense-perception of physical form, to be followed by the imagination of geometrical form. This should be carefully and thoroughly worked out orally by the teacher and class; first with the help of actual blocks, afterward by more or less perfect representatives, and by geometrical drawing upon blackboard, paper, and slates. The stereoscope and the magic lantern can be usefully employed here, and the *mensuration* of arithmetic should be brought into close connection with it.

The oral algebra should be taught as a help in the more difficult parts of arithmetic, such as interest, simple and compound, and square root. *Cube* root should, in my judgment, be omitted till it is reached in algebra.

The object of both oral courses should be preparatory; to bridge over the great artificial gap between the matter, methods and reasoning of arithmetic on the one hand and algebra and geometry upon the other.

The next objection which some will make to the course here suggested is to the arrangement of a parallel course of geometry and algebra. It certainly seems, at first sight, easier for the teacher and less complicated to complete elementary algebra before beginning geometry. But in reality there is a parallelism between the subjects which is readily traced and indicates that elementary algebra and plane geometry as wholes and in their parts are subjects of the same degree of difficulty.

The two methods, which I wish to contrast may be called respectively the "quick" and the "slow" method. By the "quick" method the pupil is hurried on from step to step, from subject to subject, burdening his memory and perplexing his understanding at every point. It is true, that if he be a boy or young man of genius (with equal concessions to the ladies, of course) he can get a rapid view of the whole in a brief space of time. But, in an experience of some years with pupils learning astronomy professionally, I have

generally found that the first thing to be done was to go critically and carefully over elementary mathematics once more, that the pupil may learn to employ them; should not this be done from the beginning?

Ordinary college students, upon the other hand, often pass over or through their mathematics and come to astronomy with poor reputations for ability and industry, and with gaps in their knowledge of the very elements. Such gaps cannot always be filled up in the college course. For example if the pupil does not reckon readily, does not appreciate simple decimal fractions, or the applications of a simple formula, or when you speak to him of a great circle, manifestly *sees* nothing but 'gives you the definition of the book without thinking; do not all these things show defects in the *earlier* training? Before the pupil begins to draw geometrical diagrams upon the blackboard should he not have learned by *observation* what these figures represent?

I would have mathematical training a mental gymnastics throughout. Not the communication of *information*, or even of the power of logically deducing conclusions from premises, is the main thing, in my judgment, but the slow building up of a mathematical mind. If education means anything, it means the discovery and development of powers unknown or but imperfectly known to the pupil. It means the training the boy or girl slowly and carefully to *do* things. Now this is necessarily a slow process, but it is one which repays the effort expended.

When I look back to my own studies in this subject, I notice that all the mathematics which I know is the accumulation of many years and has grown up in the mind by very slow degrees. And even now I frequently recur to quite elementary matters and study them with new delight, which shows that I have not exhausted the interest in them.

So, too, the art of arithmetical computation, that of the algebraic solution of problems, that of drawing figures in geometry, and of demonstrating propositions, all these arts are full of fresh interest to the mind year after year.

Let us see now how far the ordinary text-books meet the needs of the mind.

Our arithmetics habitually deal with too large numbers, and too complicated problems. The average American young man or woman needs to deal with sums of money in dollars and cents mostly under a thousand dollars: *five* significant figures as a rule are enough for him or her. The same average person does not habitually reckon correctly and easily with more than *three* significant figures, except on paper. Would it not then be better to give easier sums and more practice in them?

Let me suggest, too, that there are a few useless subjects in our arithmetics; as for instance the *details* of English money, as a special branch; apothecaries weight; a good many problems, say two-thirds, of compound denominate numbers — simple sums should take their

place — duodecimals for the most part, partial payments, as a *school* exercise; most of compound interest; cube root; alligation; geometrical progression.

I have selected these from an excellent common school arithmetic, in vogue on our side of the State line.

In other words our text-books in arithmetic are for the teacher rather than the scholar; and it is the teacher's province to select from them those things which are necessary for the pupil, principles rather than rules, near applications rather than distant, easy examples rather than difficult; and to enforce all these things by vigorous oral teaching, into which shall enter extemporaneous examples with easy numbers; and in this teaching the true relation between mental arithmetic, which is the real thing, and written arithmetic, which is its representative, should be carried out persistently.

Let the teacher say to himself or herself in looking over the examples in the book, "Has this or that example any possible relation to my life or that of any person? Is it practical, or a mere play with numbers?"

Life is too short to trouble either children or young people with arithmetical matter brought in for a *supposed* mental discipline.

The successful use of arithmetic in training the mind depends largely upon the *comprehension* of the example: the pupil should not deal with numbers which to him represent nothing whatever; he should understand the *questions* as well as the methods by which they are to be answered.

In teaching algebra the same considerations should be employed as in arithmetic. The best text-books contain little absolutely *superfluous* matter, but the tendency is to study them too rapidly and too far. As will be seen from my little schedule, I suggest very slow and careful work. The teacher should be assured that each scholar understands the main principles and can apply them not only with approximate certainty, but exactly. The principle, for instance, that a negative number multiplied by a negative gives a positive product, is one which is just as certainly capable of being rightly applied as the fact that twice three is six. The mathematician may *sometimes* set down an erroneous result for the one or the other; but the pupil can be *trained* to the one process as well as to the other. The *certain* application of algebraic principles requires not only careful practice but a long experience. I do not think an average pupil can complete a University algebra, from the beginning, in much less than three or four years, so as to know it root and branch; at least without giving it an unusual share of his time. Oral examples must often be given, of course, easier than those in the book, upon principle after principle, and extemporalia also, to be solved both orally and in writing.

What shall I say about geometry? The too common practice has been to *defer* this subject (except as very roughly treated in mensuration) till Algebra is completed; to *hurry over* the definitions

which contain the kernel of the subject, and to treat the *exact order of the book* as an important matter.

In opposition to this course the pupils should be taught to *geometrize*. This side of mathematics is *more* important, not less, than the arithmetical or algebraic; it must be begun in early life. Pestalozzi's idea is a true one and well known; it must be taught to children little by little, as matter of observation (of course not *demonstratively*), so that when *mensuration* is reached in arithmetic it may be intelligently grasped. Along with mensuration, as I have before said, should be taught the elements of geometrical form; first *concretely* by blocks, then more and more abstractly.

The pupil should now begin geometry proper; first the *definitions*, whose study should take some time; then the first books (of Legendrè or the like), which *again* should take a long time. Not only should the demonstrations be recited, but the pupil should be trained to extend their principles to the demonstration of original or extra propositions, and to apply them both in drawing and in calculation.

As thus arranged, the first year in an academical course of mathematics would be given to the review of arithmetic, with oral algebra and geometry; the second to the four ground rules of algebra, including fractions and easy equations of the first degree, and to the definitions and Book I. of Geometry, *with applications*; the third to a review of the elements of algebra, with more complicated expressions, more difficult equations of the first degree, and the subjects of powers, roots, and radicals, adding the geometry of areas and similarity, and the circle to inscribed polygons; the fourth year will be given to quadratics and various later subjects in algebra, and the measure of the circle in geometry, adding for practical purposes solid geometry as needed and practicable.

In other words, I propose that the pupil, preparing for college, should have as solid a course in mathematics as in classics. He should not be allowed to run hastily over the necessary work; the teacher should train him *in the slow way*.

This method is the *natural* one, for it is adapted to the mind's capacity and method of working; it is the way in which all *practical* mathematicians are trained, whether in the counting-room, the engineer's office, or the observatory; it is the way in which scientific men who have to make up for early defects, train *themselves*; it is the *normal* way, and the way in which good teachers study from day to day; it is the *pedagogic* way, that which is laid down by the theory of education; and last of all it is the *thorough way*.

For many years I have taught astronomy in colleges. With a new class the first thing is to sound the depths of mathematical ignorance which are to be found among the pupils. A few are good mathematicians, a great majority complain when anything mathematical is introduced; some of them think they have a natural incapacity for the subject. I have never failed, I think, to convince such a person either that he has been idle during some large part of his mathematical studies—

perhaps largely from discouragement — or that he has been permitted to run too hastily over the matters nominally required for admission to college, and comes up really not knowing them well.

The deficiencies I usually find are, as I have hinted, not in the mathematics of the college course at all ; but in the very rudiments. Such are unreadiness at *simple* mental calculations, such as any well-trained boy of twelve or thirteen can master ; a want of definite conception of the meaning and use of algebraic formulæ ; and a lack of a perception of geometrical form.

When I say, for instance, that two great circles of the same sphere bisect one another and have a common diameter, which is also a diameter of the sphere, I have before my mind (involuntarily) an image of the whole congeries of figures ; can see them with the mind's eye ; and can discuss them intelligently with a bright pupil. But there are some who seem, when such things are discussed, to talk words, without any glimpses of meaning in their minds : because they *see* nothing.

This difficulty must be met by *early* training.

In conclusion I will say, ladies and gentlemen, that I have tried to point out what I consider the right course. There are many practical difficulties in the way of following it. I am sure that the best plan, in practice, is at least to *aim* at the true method : whenever a change is made, either in courses of instruction, in text-books, or the details of daily work, to make that change in the right direction.

The skillful teacher will concentrate his work upon a few points, teach intensely, deeply,* thoroughly ; instead of attempting to go over too much surface.

WHY SHOULD THE CLASSICS BE STUDIED AT ALL?
FOR WHAT GENERAL OR PARTICULAR PURPOSES,
AND HOW SHOULD THEY BE STUDIED?

Principal EZRA J. PECK, A. M., Homer Academy.

There is no dispute about the high place which the classics should hold in any system of liberal culture. The experience of the centuries since the revival of learning has settled that. If further proof were needed it is found in the result of the discussions of a few years ago, and of the effort to ignore the value of classical training by substituting other systems.

The schools founded with this view have followed the law of the survival of the fittest and have not survived, or have changed their course and now vie with the older institutions in the thoroughness and excellence of their classical training. All our higher institutions now require a higher preparation, and give more and better instruction in these studies than ever before. In the palmiest days of the Roman empire, never were there so many students of Latin literature, nor has the Greek schoolmaster exercised so wide a control since he first invaded and conquered the homes and schools of the sturdy Latin race.

The wonderful discoveries in philology have placed it in the front rank of sciences, and if we are not ready to admit that the spade has opened to us the Scæan gates, or revealed to us the god-like features of Agamemnon, king of men, or given us the true rendering of *γλαυκῶπις Ἀθήνη*, we can easily understand that the conquest of India by the British made it possible for us to know the colonization and early history of Italy, and the student of to-day may know more of the real life and manners of the Roman race than Tacitus or Livy, and the muse of History now sings in a nobler, sweeter and truer strain than she ever warbled in the groves of the Academy.

The study of the classics has two general purpose; as an end and as a means for the accomplishment of a greater end, as a part of human knowledge desirable for its own sake, as well as the best means for the training and development of the rational powers. The practical value of this study to the common mind must be made clear to the common sense of the learner, or there will be much failure in securing its higher advantages as a means of discipline. The teacher who is not prepared to prove that six months or even three months' study of Latin will be worth the time and labor expended, and who is not able to make it so to an earnest student, has yet something to learn in the rudiments of the language, and that principal or professor who says, from the high standpoint of his experience, that Latin may be well enough, but that Greek is for all practical purposes useless, should be confined to the straight-jacket

of a mathematical professorship in a school of engineering or a commercial college.

It must be admitted, then, that to the young student at least this study must first be commended and urged as valuable for itself, as a part of the great sum of human knowledge, for the aid it will give him in the acquirement of the noble English as well as of the modern derived languages; its necessity for a correct understanding of etymology, the composition, derivation, and significance of words, and a comprehension of the laws of syntax, and to some extent, at least, even in the first year, the true spirit and force of language. He must be shown every day its value for enriching his own stock of words and forms of expression for the practical business of every day life and the enjoyment of social intercourse, whether he is to be at a mechanic's bench, a clerk in the counting room, a listener in the forum or a speaker in the Senate house. The practical teacher will make ancient history, geography, religion, law, manners and customs his auxiliaries. He will stand on the rostrum with Cicero, marshal the forces of the commonwealth with Cæsar, draw out the troops of Alexander at Issus and track Jugurtha through the deserts and jungles of Africa. By a constant reference to the great points of history he will teach facts enough to satisfy the most insatiable gradgrind of modern days—facts indisputable to a true comprehension of the true philosophy of history and knowledge of modern civilization. He may in some degree, at least, even in the academy, direct the student to the prominent points of Roman thought and Greek philosophy, which have so large a share in the civilization and life of to-day. The student will also learn another important fact, as important perhaps as any other, that the Greek and Roman languages are not dead languages. Chaucer has been called a well of English undefiled. These languages are pure springs in the living rock, whose invigorating waters still flow, adding strength and beauty to the tongue of every civilized race.

It is because the practical benefits of classical study have been lost sight of by the teacher that the results have been so few and so many have failed to appreciate its value. The superficial shallow study, the perfunctory routine teaching of any science will make it a dead science, any language a dead language, and the results will be dead. No, they are not dead; they live not only in their various outgrowths of which they form the strength and power, but in the culture of the leading thinkers and actors in every department of human activity.

Before discussing the value of the classics as a means of discipline, it may be well to offer some general suggestions in relation to methods. The particular method, the details, depend upon the character of the individual teacher and pupil. It must be remembered first of all that the student is striving to gain knowledge, and that the business of the teacher is to guide him to its attainment in the way that shall best secure the

discipline of the mind and prepare the way for higher advancement. Again, it must be considered that to learn a new language we have only to learn the differences between that and the one already learned. The great essential rule to be observed at the outset and throughout the whole course is to give principles with the application, and continue the application or illustration until such a habit is formed that no conscious effort of mind is required to use it correctly, introducing new work only so fast as is compatible with this principle. With the first lesson pronunciation with quantity and accent should be presented, and the attention of the student should be closely confined to these at each subsequent lesson until he is able to tell the teacher how to pronounce any word in the language. Too much pains cannot be taken in acquiring a fluent, easy and correct pronunciation in order that each day's exercise may be read with quickness and much drudgery avoided, the pupil able to feel the meaning of the passage before he has studied and to express it in the original sentences. No time will be lost, but rather much time will be gained. Great attention should be paid to the quantity of radical or stem syllables and the habit of noticing those letters whose quantity is determined by the general rules. The importance of this cannot be over-estimated. It is essential to correct pronunciation, and takes less time at the beginning of the course than when left until Virgil is begun, when it is indispensable. The declensions and conjugations should not be learned by rote. Especially in the Greek the student should not be allowed to read the paradigm until he has written it out according to the rules given, care being taken to place the accent correctly and to observe the laws of euphony. After this has been done they may be repeated orally for the sake of ensuring ease and fluency in pronouncing, as well as aiding the memory.

The uses of each case, the especial relations belonging to each, should be mastered as fast as they are met, and the laws of government and agreement fully understood. (Do not govern cases by prepositions.) The complex use of the relative pronoun is especially important and the signification of the various correlative words; also, the use of the particles, their original force and derivation.

The analysis of sentences from the first will be carefully attended to, and the proper relation of moods in subordinate clauses. Translation from English and into English every day. The student will carefully write out his exercises, but in no case be allowed to read from his manuscript. At the close of the recitation the teacher may spend five minutes translating and give the pupil an opportunity for correction. This exercise is especially valuable for fixing the meaning of words and the habit of sight translation, which is very quickly and easily formed. In this way the whole of the grammar, with suitable lessons and exercises, and some pages in Cæsar, may be gone over in one year, memorizing rules of quantity and accent, the declensions, conjugations, leading points of syntax, and the rules. The second year the grammar will be reviewed and

the details and exceptions carefully noted, and prosody, so far as relates to hexameter verse. The third year the grammar should be needed only as a book of reference, but should be constantly referred to, and the habit formed of accounting for every form of etymology and every peculiarity of construction. If this is done thoroughly the faculty of apprehension becomes comprehension, the ability to use facts and principles is strengthened, and the student becomes aware of the real value of his study as a means of discipline.

If this course is rigidly pursued with the usual requirement in mathematics, and the collateral history, geography, and other subjects necessary to a classical course, the real student is prepared to do better work in science or literature without a teacher in his leisure hours than he would have done previously with a teacher and a school. Besides this he has this advantage: He can choose to go to college, and will not be obliged to say, "If I had only been allowed," etc.

These are some of the practical benefits of a classical course in the academy, but it is to classics as a disciplinary study that we must concede the highest claim.

To study is to give zealous attention and devotion to whatever engages our thoughts. It is a resolute concentration of all the powers of the mind, heart and soul upon a given object. This makes teachers. This makes scholars. This makes great men and great women; cultured men and cultured women, and it never fails.

This work, rightly directed, is education, a bringing up, a training, development. Without this there is no education in the proper sense of the term. Men may gain knowledge because they cannot help it, by their senses, by superficial observation, by experience, by failure, but they cannot acquire education. Education is something to be done. It is strange that there should prevail such shallow notions of education as that "knowledge is power," that education is to acquire knowledge and fit man for the active duties of life, when the main active duty of life is thorough mental and moral training. We would not greatly object to this feeble definition if those who were satisfied with it were not satisfied with a very limited application of it; if it were not too often the case that those who decide upon the characters and methods of study, have a very inadequate conception of what it is to be fitted for the active duties of life; if we did not meet so many who mourn too late that they have closed their course of study without doing any real study at all.

The acquisition of knowledge is not education, but a means incidental to the process of education.

To study, then, to give zealous, devoted attention of all our powers to subjects worthy of such pursuit, is the great work of man, and its great end is real education. It is to cultivate to the fullest extent that part of us which is to do the work here and to have the enjoyment here and hereafter. It is to make us capable of the greatest enjoyment here as well as able to do the greatest work here for ourselves and others: to make us more capable of receiving the lessons of Nature and Providence.

To enable us to think clearly, logically and consecutively, to reach out after truth, to find it and bring it home, to master and appropriate it, and to tell it to others, forcibly and convincingly; this is education, and to this we may well exhort the highest zeal, the most unremitting study, with its full and glorious meaning. To this end all science, all knowledge, all subjects of human thought may be made to contribute, each valuable for its own sake and adapted to develop the reasoning faculty and especially valuable as it develops the whole man, broadly, evenly and systematically.

The experience of civilization abundantly proves that different courses of study cultivate the mind in different ways. Mathematics with its positive demonstrations, has its field. Physical science, with its wonderful phenomena absorbing the attention of the whole being, finding effects from causes, proving causes from effects, establishing axioms of thought and belief, leading the true student and devout thinker almost beyond the threshold of infinity, also has its special field.

But most important of all is language. This is first to be studied and to be continued always both for its own sake as a science, and because it is the basis or open door to all thought and all knowledge. It claims our attention because it is the oldest of the natural sciences. From the feeblest cry of the infant to the song of the seraph, language is natural, and as much a science of nature as the song of birds, or the music of the spheres. The great difference is that the true science of language goes beyond nature, transcends the limits of the finite, and has to do with Divine science. It is not only natural to man, but to Him who gave man the power to think and the power to express all his emotions, thoughts and desires. What is thought or feeling to one who has no means of expression? — but little more than the instinct of the brute.

It is the oldest of the sciences both as regards the race and the individual, for it has to do with the first real things of conscious existence, Ideas (*ΐδέε* (*vide*)). Ideas are not until some definite object sign or word gives them form and identity.

Words, then, are real things, I had almost said the only real things, for without them how little is seen or known, or as it were is tangible to the real man. Without words thought dies, knowledge is not even a myth, and feeling is only instinct. We have all of us mourned our poverty of words, and none more than he who has a store of them, for what he has gained in thought has only opened to him a broader field and increased desire. Words, then, are real things necessary to our real existence, and hence to the first steps of advancement in mental growth; and it must be conceded that a proper, constant and judicious training in language is indispensable. As it is the first means of culture, so is it constantly more and more adapted by the law of action and reaction to the ever expanding power and increasing demands of the mind. No sooner is the thought born into words and the name, or quality, or idea becomes familiar, than it, in turn, like the spark in Rhumkorff's coil multiplied a thousand fold, becomes the parent of an ever widening circle

of ideas. The more facility the student has acquired in the use and relations of words, the better he is prepared for the physical sciences. Of all subjects none present a more delightful field for study, none are better adapted to give breadth and tone to the mind than those that treat of the phenomena of the universe. But it is language that unlocks the mysteries of science, and nature most readily unveils her most charming scenes to him who has this "open sesame." Mathematics is one of the most essential parts of a thorough system of mental training, but what is it to him who is deficient in language? From its very nature it dwarfs while it strengthens. But to one trained to forcible logical expression it becomes a language full of rich and far-reaching philosophy.

Again, language is adapted to mental culture because it is the most practical of all the sciences. In every day business, even in the common walks of life, we are mainly dependent upon the words we are able to use rightly.

In every department of human action it is he who can best express his thoughts, feelings and desires that is best appreciated, exercises control of those who are about him, and wins all that is worth winning.

True, we are not all to be prophets, apostles, or teachers, or poets, or orators, but we must all be listeners, and culture is as necessary to him who hears, as genius and power of expression to him who speaks. The most gifted harangue falls dull and lifeless upon those that are slow to hear and apprehend.

It was not alone the mighty genius of Demosthenes that gave him power to sway the masses of the Athenians and that made him an intellectual giant. It was mainly owing to the fact that he spoke to a people — the most highly cultured the world has ever seen, to the pupils of Socrates, Plato and Aristotle, to the judges and critics of Sophocles and Euripides — a people whose familiar conversations in every day life were upon the highest themes, and who spent their time in nothing else than in telling or hearing some new thing.

The study of language is also the most practical means of culture, because its method of growth or formation is directed by the laws which govern the mental growth and development, and if a correct method is pursued in the thorough acquirement of language the best mental discipline is at the same time secured. For in this work patient, thorough, accurate investigation is necessary; the reasoning power is brought into constant use; the relation between cause and effect must become apparent at every step; the memory is forced into action, and the mind must become quick in comparison and invention. In this work the constant application of rule and principle to practice is requisite until the habit once formed becomes a second nature. Then the road to the acquisition of knowledge is opened; then, and not till then, is one prepared to pursue knowledge for its own sake.

While it must be admitted that the study of any language has

these advantages in a greater or less degree, this is true especially of classical study. This study is indispensable as a basis for a thorough knowledge of the derived and cognate modern languages, for a perfect comprehension of the philosophy and spirit of language, as well as familiarity with the composition, derivation and signification of words.

In every proper method of acquiring these languages there is presented to the mind with every inflected word the following particulars :

Inflection	Declension.	{ case. number. gender.
	Conjugation.	{ mood. tense. person and numbers.
	Comparison.	
Pronunciation		{ quantity. accent.

Root or stem and laws of euphony ; derivation, composition ; cognate, or derived words in other languages and signification.

Syntax ; the choice between the several uses of each case, or mood, and tense.

No less important and necessary is the study of the uninflected words, the connectives and particles, their derivation, their original signification and use in the sentence.

This study involves a most rigid analysis and the most complete synthesis ; and thus is formed the habit of carefully examining the most minute details and combining them instantly into a perfect whole, calling also into necessary healthy and prompt action the memory and quickening the powers of invention and perception. When this is done thoroughly in the time usually devoted to the classics, the time needed to master any of the modern languages is shortened by more than one-half, not because of the knowledge gained, but because of the habit of thought acquired. Again, if the study of derivation and word formation is begun at the start and closely pursued, correct taste in the use of words best adapted to the thought is cultivated and pure expression becomes a habit, and purity and clearness of thought is educes and the art of logic or reasoning becomes natural and easy. This study produces simplicity and force of expression because the most perfect models of simplicity and force are constantly presented to the mind, and the work of translation both assimilates the thought and imparts its character to the mind of the learner.

Briefly, there is not a faculty of the mind that does not receive greater precision and more definite aim from classical study. By these languages we are brought nearer the first creations of mind, and they are themselves the results of the highest culture the world has ever known. If it is true that thought gives birth to language and in turn language produces, moulds and develops thought,

we can easily see how the Greek language made the Greek race first in culture. The law of action and reaction is just as true in the mental and moral as in physical science. The race, whose strolling minstrels produced and sang the Iliad, taught by the inspiration of that grandest of epics, might well produce an Æschylus, a Sophocles and Euripides, whose tragedies are still the master pieces of literature.

Unsurpassed in poetry and in art, and in all refined culture, when Greece lost her political supremacy her sons became the school-masters of Rome, and the Latin race received that culture that gave to the world the grandeur and beauty of Virgil and Horace ; and to-day our philosophers sit at the feet of Socrates and Plato and Aristotle, and our poets still drink of the Pierian spring or climb the heights of Parnassus, and great indeed is the culture of that people whose orators do not fall below Demosthenes and Cicero.

The fact that in these languages are found the best models of style and purity and force of expression ; that their authors, by their culture and genius, unaided by revelation, founded the mental and moral sciences, is sufficient to show that they are adapted to the culture of the highest thought and especially fitted to train the mind for philosophical investigation. When we consider and compare with their work the work of those who, aided by them and the light of revelation, have since wrought the advance in these sciences, we shall rank Cicero among the greatest philosophers, as well as first among orators and statesmen, and shall see that Socrates was not vainly superstitious when he felt the guidance of an invisible spirit in his life and work.

The Roman language grew with the race and became strong, versatile, flexible and graceful. The Hellenic language grew with the race, becoming a language of music — tuneful, refined, and elegant — and though simple and concise in its structure, adapted to every phase of human thought, each in turn imparting to succeeding generations the culture and nobility of thought which have been the rich inheritance of the new races, laying the foundation for true philosophy and true religion, and giving birth to the languages that should fitly tell them, culminating in the richest of all — the noble English tongue.

Language study, then, is to be commended as a disciplinary study for these reasons: It is natural to the mind, the first necessity of culture, and is the product of human thought and the means by which thought is produced. As a science it has the widest scope in its necessity for all other sciences, requiring in its methods of study all the elements required for success in investigation and admirably adapted to strengthen broadly and evenly all the mental powers. And finally, it is to be commended, because of the difficulties it presents, requiring the closest attention and concentration, compelling the student to depend upon himself, and thus developing the habit of original thought and investigation.

Since, then, the study of language is of a practical value for its own sake, and for the active pursuits of life equal, at least, to that of any other study, we do not give too much time to it in the academies. But as it is worth for the real education and development of the whole man as much as all the rest of the sciences, as it is the basis upon which all development rests, we do not give time enough, nor thoroughness enough to its pursuit. As the great majority of students must end their course of training with the academy, it is to the academy we must look for whatever of culture is found in the common walks of life. We want thinkers in our workshops, in the counting-room, in our primary schools, as well as in the pulpit, the forum, or the senate. We want right thinking in every hamlet to compel right thinking and right acting in the legislative hall.

Again, the definite aim of through culture must be given to our academies that the possibility of an enlarged liberal culture may be given to the greatest number, that the fields of science, religion and politics may secure the greatest number of the best intellectual laborers. And, finally, as the American college system has surpassed the university system of the old world in its adaptation to the general culture of the people; when the academy shall do all that belongs to it, and shall take its proper work as a disciplinary institution, then will our colleges equal, if not surpass, the universities in the degree and extent of individual culture, and the demands of the age for more science, more literature and more art be fully met

THE IDEAL CONVOCATION.

Principal GEORGE R. CUTTING, A. M., Waterville Union School

As my esteemed friend, Editor Bardeen of the School *Bulletin*, was chatting with me on my return from last year's Convocation, he exacted from me the promise to write an article for the October number of his journal upon the theme: "The University Convocation; Does it meet our wants? Can it become a representative gathering?" I reluctantly complied, and my good friends, Dr. Murray and Principal Gates, kindly adopting a few of the suggestions therein presented in the arrangement of the present programme, have capped the climax of their punishment by insisting that I shall present before the convocation entire, the few points of improvement that I then suggested, modified, as they have necessarily been, by our experience of the past two days. The fruit of an hour's writing, last evening, I claim nothing erudite or original in my propositions (who can not play the critic?), and simply offer my remarks of this morning as a target for a general shooting, all earnestly working as we are for a common good in this our annual gathering.

The University of the State of New York, comprising, as our chancellor told us on Tuesday, twenty-two literary colleges and some two hundred and fifty-two academic institutions, was, beyond question, a grand conception, and is to-day an institution of which our State may be proud, whether considered historically or practically. In 1863, some good inspiration of the powers conceived and instituted the idea of an annual convocation of the members of the Board of Regents with the instructors and trustees of the various colleges, normal schools and academic institutions. The object of the convocation, as expressed in the records, is:

1st. To secure a better acquaintance among those engaged in these departments of instruction, with each other and with the Regents.

2d. To secure an interchange of opinions on the *best methods* of instruction in both colleges and academies; and, as a consequence,

3d. To advance the standard of education throughout the State.

4th. To adopt such common rules as may seem best fitted to promote the harmonious workings of the State system of education.

5th. To consult and co-operate with the Regents in devising and executing such plans of education as the advanced state of the population may demand.

6th. To exert a direct influence upon the people and the Legislature of the State, personally and through the press, so as to secure such an appreciation of a thorough system of education, together with such pecuniary aid and legislative enactments, as will place the institutions here represented in a position worthy of the population and resources of the State.

Could anything be better as a proposition?

In my last summer vacation I chanced to meet some of what I call first-class principals of first-class academies, and eminent college instructors. I loyally reproached them for non-attendance at the annual gathering, only to find that they had long since abandoned the Convocation as hopeless, as far as any practical good could be hoped for, in assisting them in their educational work. I believe in the possibility of reform and do not believe in deserting a ship just because in steering toward a desired port she does not sail in just the channels that I would attempt if I were a pilot at the helm. With all due deference to the officers of the Board of Regents and executive committees of recent convocations, I venture, after an extended conference with college and academy instructors, to claim the following as

FACTS :

- I. *The Schools and Colleges of New York State are not represented as they should be in the Annual Convocation.*

The minimum attendance of delegates would be a thousand, under the schedule of representation allowed, if all were present who should attend ; but when a score of colleges and seventy-five academies are actually represented, it is felt, as this year, to be an occasion for especial congratulation. How often, in recent years, has the audience, at the reading of a paper, dwindled to a sleepy dozen, outside of the officers and reporters.

- II. *The Papers presented previous to this year have not been for the most part in furtherance of the advertised objects of the Convocation.*

As to "the better acquaintance" with the principals, college professors and Regents, the objects are met, so far as I know, though the limited attendance does not usually afford a very large field for such acquaintance. But social benefits were, in my interpretation of the objects, incidental rather than fundamental.

As to "an interchange of opinions," the vital object, in my judgment, I can recall but two lively discussions for the past eight years previous to the present session, which, let me say in passing, I regard as the most practical gathering for the nine years that I have been in attendance. All honor to Secretary Murray and Pratt, and the able executive committee of 1881.

A GENERAL PROPOSITION.

The convocation should and can be made so practical that no one of the thousand delegates *can afford* to be absent. Labor in the following out of the changes adopted this year will demonstrate the above. Of head and hands there should be no lack, and fees could easily be raised if necessary to insure success. Intelligent men are always ready to pay for value received.

We have to pay for everything else that is good for any thing. Let us, if need be, directly pay for and have profitable convocations.

I would respectfully suggest:

I. That the executive committee being, as now, the most competent and practical of our educators, should represent equally all interests of the convocation. The literary colleges, academies, and academical departments of union schools are the three kinds of institutions having allied, yet distinct interests in this convocation. Nine members could thus be equitably apportioned.

II. These three sub-sections of the executive committee should alone be held responsible for the subjects to be presented in their own departments. Let us never, after this year's experience, return to the old method of asking all institutions to *volunteer* papers. We want to hear papers on practical subjects from men who are known to be competent, experienced; in short, worth hearing on the subject. The men of sterling ability whom we all want to hear from are deterred by modesty (a not uncommon accompaniment of merit), from *volunteering* to present papers. In a lecture course at our homes we should not think of depending on volunteers. The prestige of a convocation conducted on this standard would elicit responses from those whom we want to hear.

III. The executive committee for the following year should be announced on the first day of each convocation, to allow a general outline to be made at sessions of the committee held, while they consult with their fellow teachers, between the sessions of the convocation then in progress.

IV. The programme of the convocation should be announced and widely advertised among teachers, at least, two months in advance. As it now is, some of us, owing to absence from our homes, because of attendance at other educational meetings, did not get the programme for 1881 till just before leaving for Albany. Teachers, from the methodical character of their life-work, form their vacation plans as well as their school calendars, some time in advance. When *en route* to this meeting I met an esteemed fellow-principal of one of our large cities on the way to the sea shore, and he alleged as a reason for his early departure and neglect to meet with us, that he hadn't heard that there was to be a convocation this year. This suggests the much discussed change in the time of our annual meeting.

V. With all deference to the committee that reported yesterday in favor of a session in January, I am sure that I speak for the principals of Union schools, in whose class-room work and work of superintendence there can be, in most cases, no substitution or cessation of labor, when I say that vacation-time only can be sacrificed to this meeting. If not held in the summer, as now, I would myself cheerfully set apart three days between Christmas and New Year's—a universal vacation week—for the convocation. I cannot now see how principals of Union schools could come at any other

than these two seasons, but I am convinced that the present is the most feasible time for all interests.

VI. Let our Board of Regents officially announce to the Boards of Trustees and Boards of Education of the institutions here represented, that the annual convocation is to be a practical representative assembly of college and academic educators; that representation by delegate will be essential to the highest success of their institutions. Such authority would, I am sure, result in an increased representation, and in the paying of the traveling expenses of such delegates by the local board; and thus, I believe, a hundred circumstance-bound but successful teachers, living in remote sections of our State, could be added to our register of attendance.

VII. I do not believe the convocation is the place for the presentation of essays—even interesting essays on interesting educational themes, except as such essays have some practical bearing on college and academic work; and ordinarily, I would suggest but one paper for a session. Who does not see that the excellent papers of Prof. Gardiner, on “Education of the Masses;” of Prof. Safford, on “Mathematics;” of Prof. North, on “A Chair of Pedagogy;” of Warden Fairbairn, on “Small Colleges;” of Prof. Frink, on “College Discipline;” have each and of themselves enough in them for thought and discussion during an entire session. The chancellor’s gavel stopping a profitable discussion to introduce a new speaker and new subject, breaking one’s previous chain of profitable thought, confirms my opinion that he is unequalled as a prompt, impartial and dignified presiding officer; but I have no doubt that he has himself, with us, been pained, by the excessive demands of the programme, to stop a practical and lively discussion when so eminent educators were rising to speak forth their views. Fewer papers and more discussions is my point.

VIII. Instead of an aggregation of subjects and interests, the convocation should be divided into alternating college and academy sessions, both uniting in the “annual commencement day,” as now—every day with its programmes and time-schedules previously furnished, so that a delegate could attend what most interested him, if not able to attend all.

IX. If the executive committee lack for practical themes, let them furnish blanks to institutions, upon which subjects for discussion may be suggested, such as will meet the known wants of those who would receive such blanks.

X. As a Union school man, I want to hear from my fellow-teachers on such topics as:

Are “teachers’ classes” desirable auxiliaries to the Union school or academy curriculum?

Are prize contests beneficial?

Should the Regents’ academic examinations be the sole test for graduation from our academic departments?

An “experience meeting” as to methods and results in both preliminary and academic examinations would attract, I think, a large attendance.

Could not the details of questioning, management, and supervision of these examinations be further and profitably modified?

Then, what a throng of practical subjects are all the while pressing themselves upon *college* men! The thoughts suggested by such practical papers as that of Prof. Gilmore, of Rochester, upon "Home Studies," are worth a dozen journeys to the capital city; and then, what a flood of practical subjects crowds upon us—themes of common interest to the college and academic instructors, such as "Uniform standards of admission to colleges;" "Shall *quality* be sacrificed to *quantity* in preparation for college?" "Shall colleges admit by examination or certificate?" All papers should be limited in time so as to admit of full interchange of opinion by other disputants or by volunteers.

Let the educational magazines have the essays! We shall enjoy them best in our hammocks or in our easy chairs in our libraries; let the convocations of the University of the State of New York give, at least, two days of each annual session to the discussion of subjects that will attract hither the majority of our college and academic instructors—subjects like those of 1881, that will have a practical bearing upon the year's educational work!

PALÆONTOLOGICAL EVIDENCES; AS BEARING
UPON THE THEORY OF EVOLUTION.

Professor HENRY S. WILLIAMS, Ph. D., Cornell University.

It is of no small importance that those holding the high position of teachers, whose opinions are weighty in shaping the opinions of others, should examine carefully the nature of the *facts* and their bearing toward any popular theory.

Especially is this the case when the facts are not easily accessible.

Such shall be my excuse for asking you to examine the foundations of a theory which is enthusiastically believed by many, and is very influential upon the thought of our times.

My theme is the evidences of palæontology in their relations to the theory of evolution.

To its discussion it would be presumptuous for me to expect to bring any thing new, but we may be able to analyze the multitudinous phases of opinion, and amidst all the clamor of speculation learn (1) what the theory really is, and then (2) determine what kind of facts can furnish evidence for and against, and finally (3) what such evidence testifies in regard to the theory of evolution.

A theory has been proposed to account for the origin of the different kinds of organisms now existing on the earth.

In this theory two fundamental points are involved.

First: The *mode* of the origination of the different kinds of organisms.

Second: The *cause* of the differences exhibited by them.

If we examine and carefully compare the various definitions given by the leading authorities for this theory, such as Darwin, Huxley, Spencer, Tyndall, Hæckel, Wallace, and others, and also study the crystallized formulæ which the latest dictionaries and cyclopædias offer, we find with all its variations the theory of evolution takes decided and uniform stand on these two points.

In regard to the *mode* of origination, or what is called the "order of nature," in the appearance of all the differences now existing in the universe, it is affirmed to be one gradual modification, a slow, continuous passage from the simple to the complex.

In this respect the theory is directly opposed to the old view of creation, in which each kind of organism is regarded as coming into being just as it is now represented by its offspring. In regard to the *cause* of such changes the theory denies that it is to be found outside the universe of matter exhibiting such phenomena and such change.

Whatever there may be of the nature of cause in relation to the effected coming-into-phenomenal existence of new forms or functions in organisms is held to be a "potentiality" "immanent" in the previously undifferentiated matter, or as some kind of "force"

hitherto "latent," which finally comes to an expression of itself, by its own power.

Such a doctrine is logically in contra-distinction to the belief in a personal creator, the author and preserver of the universe, which assigns the production of differences in kind of organisms to extra- or supra-natural cause.

In confirmation of the correctness of these statements let me cite the article on evolution by Prof. Huxley and James Sully in the ninth edition of the *Encyclopædia Britannica*, where will be found the following:

"Evolution includes all theories respecting the origin and order of the world which regard the higher or more complex forms of existence as following and depending on the lower and simpler forms, which represent the course of the world as a gradual transition from the indeterminate to the determinate, from the uniform to the varied, and which assume the cause of this process to be immanent in the world itself, that is thus transformed." (l. c., p. 751).

Thus the theory is decidedly opposed to the belief that any phenomenon is expressed in the universe whose occurrence is not sufficiently accounted for by previously appearing phenomena; and thus accounted for, the order of appearance of distinct organisms is essentially and universally one by gradual modification.

Applied to the origin of different kinds of organisms this requires that they appear by natural descent from previous organisms, and these from still previous unorganized matter, and it — from we don't know what or whence — from God, if there be a God.

From this brief analysis it will be seen that the second point (in regard to the cause of differences) involves metaphysical discussion far outside the province of scientific observation.

The results and the evidences for and against, are matters of belief, and not of knowledge to be obtained by any method of physical research.

Nevertheless, since this part of the theory is generally regarded as intimately hanging with the other, and since it is largely assumed that the particular mode of origination can be associated only with this assumed cause, the discussion of the *mode* becomes of special importance in its bearings upon the speculations as to the *cause*.

It is plain that any certain evidence of the mode of origination of new kinds of organisms is to be obtained only by search of the records made at the time when new kinds are acknowledged to have taken rise.

But, for reasons which may appear later, there has been a strong disposition on the part of defenders of the theory to reject the evidence of fossils.

The *living* world they say and not the dead must decide the question, and especially the microscopic study of individual development is able to give proof of the correctness of the theory.

The embryologist and the anatomist are concerned about the order and the results of individual growth. They note with care the suc-

cessive stages of modification by which the worm becomes an insect, a chicken, a frog, or a man. The result of their most profound research ends with showing what stages are actually passed through on the way to maturity for each case, and one of the most remarkable results is the showing that, in the early stages of development, very many of the important distinguishing characters of the adult are absolutely invisible; no magnifying power has been able to detect the least trace of what is afterward to be. Yet, in the course of development, at the appropriate stage, according to law, but a law in each case determined by ancestry, each individual exhibits the distinctive direction of growth, which infallibly testifies what it will be at maturity and whence it came. •

Here all is natural, for antecedents are surely followed by their consequents; but there is only embryological or individual growth.

Again, examination of the variable elements in individual growth has shown that their appearance or absence is conditioned in the case of any given developing individual, by various outside circumstances, a certain degree of latitude being allowed for the adjustment of the individual to whatever may prove to be changed circumstances, compared with those of its parentage. It is this observed ability of the individual, while following out the law of its development to suffer at the same time some degree of deviation from the track which its immediate predecessor trod, which has suggested the strong hope that in this line of research is to be found the explanation of ALL the differences observed in the organic world.

But, having ascertained the laws of individual development, although it may appear a reasonable assumption that here is an epitome of the evolution of species during geological ages, it requires but a moment's reflection to see that any evidence furnished by the study of embryology, or the growth of the individual, cannot of itself go one step toward showing what may or may not have been the order of origination of new kinds. If, in fact, embryological development be an epitome of palæontological "evolution," a study of the facts of palæontology and comparison of them with those of embryology can alone prove the fact. But, even then, palæontology would furnish the proof of that which embryology can only suggest.

Respecting the importance of palæontology to the solution of the whole problem, Prof. Huxley has made very clear and just statements. In his lecture on the coming of age of the "Origin of Species," delivered on March 19, 1880, he says, after rehearsing the evidence in its favor furnished by embryology and by other branches of natural history:

"But all this remains secondary evidence. It may remove dissent, but it does not compel assent. Primary and direct evidence in favor of evolution can be furnished only by palæontology. The geological record, as soon as it approaches completeness, must, when properly questioned, yield either an affirmative or negative answer. If evolution has taken place, there will its mark be left; if it has not taken place, there will lie its refutation." (Nature, vol. xxii, p. 3.)

Embryology does reveal a strong analogy to what is supposed to be the order of appearance of forms in the past; the study of living organisms does reveal tendencies towards change, which, if carried far enough, would be such as are required by a theory of gradual modification, but the actual proof lies with the facts of history.

Without entering upon any of the side issues, let us confine our attention now to the one proposition, which, among all the varieties of opinion, we believe to be a fundamental tenet of evolution:

The mode of origination of different kinds of organisms included a gradual modification of descendants, as compared with their ancestors, and this process in the main was extremely slow.

What does palæontology testify respecting this proposition?

Those who read the first edition of Darwin's "Origin of Species" will recall his frank avowal, that the transitional forms demanded by his theory had not then been found in the rocks. "Geology," he said, "assuredly does not reveal any such finely graduated organic chain, and this perhaps is the most obvious and gravest objection which can be urged against my theory." (p. 280.)

That was in 1859. Let us see if the indefatigable search made since that time has brought any different story out of the geological record.

In 1862 Prof. Huxley said before the Geological Society: "What, then, does an impartial survey of the positively ascertained truths of palæontology testify in relation to the common doctrines of progressive modification, which suppose that modification to have taken place by a necessary progress from more to less embryonic forms, or from more to less generalized types within the limits of the time represented by the fossiliferous period?"

"It negatives those doctrines, for it either shows us no evidence of such modification, or demonstrates it to have been very slight; and as to the nature of that modification, it yields no evidence whatsoever that the earlier members of any long continued group were more generalized in structure than the later ones."

And again, considering the modification seen upon comparison of the earliest known fauna and flora with those of the present, he said: "The insignificant amount of modification which can be demonstrated to have taken place in any one group of animals or plants is quite incompatible with the hypothesis that all living forms are the result of a necessary process of progressive development, entirely within the time represented by the fossiliferous rocks." (Lay sermons, Am. ed., p. 225.)

When taken in connection with some declared opinions of Prof. Huxley, these statements seem inconsistent; but, whether one accepts or rejects his theories, every one must accord that, as an accurate observer and in the clearness of exposition of matters of fact in the sciences with which he is familiar, Prof. Huxley has few equals.

Again, Prof. Dawson, in a little book, entitled "The Chain of Life in Geologic Time," published without date, but, I believe,

within the last five years, gives the following summary, among other results, of his careful survey of the field :

"4. Species, like individuals, have greater energy and vitality in their younger stage, and rapidly assume all their varietal forms and extend themselves as widely as external circumstances will permit.

"5. Many allied species, constituting groups of animals and plants, have made their appearance at once in various parts of the earth.

"8. In regard to the larger and more distinct types we cannot find evidence that they have, in their introduction, been preceded by similar forms, connecting them with previous groups.

"10. Palæontology has not and probably cannot furnish direct evidence of actual transformation of one species into another, or as to the actual circumstances of creation, but the drift of testimony is to show that species came in *per saltum* rather than by any slow or gradual process." (l. c., p. 260.)

Prof. Dana, in 1874, says in regard to the transitions between species, genera, etc.: "A survey of the history [geological] finds little that is positive with regard to these transitions. It discovers, as all writers admit, almost no cases of gradual passage of one species into another, not nearly as many or as close as exist in the present world." (Manual of Geology, p. 600.)

Mr. S. H. Scudder, at the conclusion of a paper on the "Relation of Devonian Insects to later and existing types," 1881, says: "While there are some forms which, to some degree, bear out the expectations based on the general derivative hypothesis of structural development, there are quite as many which are altogether unexpected and cannot be explained by that theory without involving suppositions for which no facts can at present be adduced." And he further says: "On the derivative hypothesis we must presume [several things which are mentioned] carrying back the origin of winged insects to a far remoter antiquity than has ever been ascribed to them; and necessitating a faith in the derivative hypothesis which a study of the records preserved in the rocks could never alone afford, for no evidence can be adduced in its favor based only on such investigations." (Am. Jour. Sc., 1881, p. 111.)

Prof. Alex. Agassiz, in his address as president of the American Association of Science, 1880, after a most exhaustive study of all the known echini, fossil and recent, said: "It certainly has been shown to be an impossibility to trace in the palæontological succession of the echini anything like a sequence of genera. No direct filiation can be shown to exist, and yet the very existence of persistent types, not only among echinoderms, but in every group of marine animals, genera which have continued to exist without interruption from the earliest epochs at which they occur to the present day, would prove conclusively that some groups among the marine animals of the present day are the direct descendants of those of the earliest geological periods." (See Report in Science, vol. 1, p. 141, etc.)

Sir Wyville Thomson, after examining the results of the "Chal-

lenger" dredgings in the deep seas, from whose faunas, on account of their resemblance to those of the Tertiary and Cretaceous deposits, much favorable evidence was expected, says, in the "Introduction to the Final Report," 1880 :

"Species are just as distinctly marked in the abyssal fauna as elsewhere; each species varying within its definite range as each species appears to differ at all times, past and present. * * * * Transition forms linking species so closely as to cause a doubt as to their limits are rarely met with. * * * The character of the abyssal fauna refuses to give the least support to the theory which refers the evolution of species to extreme variation guided only by natural selection."

The distinguished palæontologist of Bohemia, M. Joachim Barande, after a life's devotion to the critical study of fossils, in his work "*Brachiopodes, études locales*," 1879, expresses, among others, the following conclusions as the results of his research, (translating) :

"1. All the species and varieties of Bohemian Brachiopods made their appearance with the fullness of their distinctive characters.

"2. With very rare exceptions, all the variations, great and small, of our specific types have been contemporaneous with the species to which they are associated.

"3. The differences which are manifested between the specific types and their contemporaneous varieties are not less intense than those which one observes between particular types and the varieties succeeding or preceding them." (I. c., p. 93.)

More evidence of like tenor might be cited from equal authority. But I have selected the above as representing the mature judgment as to matters of fact of the men of first rank in their special departments of science, but who differ radically among themselves in the theories and beliefs which they hold as consistent with the facts.

Investigations of my own have brought out evidence in entire accordance with these statements.

Hence will be readily inferred the reason why palæontologists accept the theory of evolution, if they accept it at all, with decided modification.

These clear and direct statements, from such undisputed authorities, can leave no doubt that the difficulty felt by Darwin when writing his "Origin of Species," in 1859, still exists. The facts still fail to give any more favorable testimony on this point. They decidedly contradict the supposition that the appearance of new kinds of organisms was by a process of slow and gradual modification.

The adverse bearing of these facts, whose force appears to increase the more closely they are examined, has led the earnest upholders of the theory of evolution to strengthen their position by other arguments. Permit me to refer to two of these.

(1.) The analogy of the metamorphosis of insects and amphibia is adopted as applicable to the cases of sudden appearance of new species in the past; and

(2.) Because the actual time and the order of events in the geological record does not meet the needs of the theory, the time is supplemented by adding more than is recorded, and it is presumed that it was all crowded with life of which no formal trace is left (formal, I say, for I am well aware of the argument based upon the presence of calcite and graphite below the fossil bearing rocks). And whenever the new forms do not appear in the proper order required by the theory, it is assumed that the record itself is deficient.

In reply to the *first* of these attempts to adjust the theory it may be said, that at the best the analogy is a pure assumption, and, we believe, does not apply to the case. For the suddenness in metamorphosis of insects is only apparent—the changes taking place are gradual, as are all those in the development of the individual. In metamorphosis changes going on within are concealed by an outer covering which remains uniform, and suddenly bursting reveals what has taken place while all appeared dormant. Further, this process is strictly natural, since the organism follows the precedent of its ancestry as truly in this as in any other process of growth.

In order, moreover, to apply the analogy to the case of the origination of new forms, there arises the necessity of assuming that a series of organisms which, from generation to generation have exhibited a definite and uniform combination of characters, should, at some individual act of generation, produce an offspring which fails to follow the law of heredity, but in a specific and entirely new way transgresses this established law and develops into a form never before seen among its ancestry nor in the world.

From the fact that the new form together with its offspring shows no tendency to resume the characters of its ancestry, but strictly maintains the combination of characters peculiar to itself, it is also presumable that at its outset there began a state of sexual sterility toward the representatives of the ancestral form which still persists by its side. The use of an analogy which requires such enormous assumptions appears to us unworthy the name of even a scientific *hypothesis*.

As to the *second*, to assume for the existence of organisms on the demand of a theory, twice or more the length of time of which palæontology gives any record, appears like a subterfuge.

We must bear in mind that evolution is advanced as a scientific theory to account for the order and origin of the universe by what may be known from investigations of the physical facts themselves. Only so far as facts support it is it entitled to rank as scientific; and the demand for double the time and for "swarms of organisms," of which there is preserved no direct evidence, is a confession that the theory when tested by the only group of facts regarded as fully competent to testify of its validity, fails of proper confirmation.

Even as a matter of simple reason, is it any less consistent with the principles of science to demand that the universe be supplemented by unknown facts and phenomena, of which the evidence

is utterly wanting, than to call in the action of some force beyond those exhibited in what we call the laws of nature?

As evidence that I am not overstating the matter, let me quote from the last edition of Darwin's "Origin of Species." (1880, p. 286.) Mr. Darwin there says: "Consequently, if the theory be true, it is indisputable that before the lowest Cambrian stratum was deposited long periods elapsed—as long as or probably longer than the whole interval from the Cambrian age to the present day, and that during these vast periods the world swarmed with living creatures."

Let it be borne in mind that "below the Cambrian strata" there is not the least morphological trace of the existence of any organism (excepting the problematical Eozoon, which certainly may be only mineral), and that, "from the Cambrian age to the present day, includes the whole of the geological series, where, if it took place, the record of evolution must be found.

So important, however, is this "demand" of Mr. Darwin, as Mr. Wallace calls it, that in his recent work on "Island Life" he devotes a whole chapter to a theoretical adjustment of the age of the earth to satisfy this demand. He cites, also, Profs. Huxley and Ramsay as agreeing with Mr. Darwin in the opinion of the necessity of such a demand for the consistency of the theory.

We have dwelt at some length upon the palæontological evidence of the mode of origin of new kinds of organisms, since it is claimed to be an essential tenet of the theory of evolution that this be by slow and gradual modification, and also because it is capable of a purely scientific treatment.

There are many and familiar facts which are used with much force in support of the theory; such as the filling of gaps in the series of organisms, until recently unfilled; the famous series of fossil horses accumulated by Prof. Marsh, and of which powerful use was made by Prof. Huxley when in this country; the discovery of toothed birds, presenting features of reptiles and birds in the same individual, and other facts brought to light by the palæontologists, tending to make the organic series more complete than possible by study of living forms alone.

The recent investigations of the palæontologists have given us much light respecting the past history of the earth and its inhabitants, but the theory of which we speak is a theory to account for these facts as they are, and when examined critically, as we have seen, the order of their appearance appears to differ essentially from that presumed by the theory.

If the order of origination of new kinds of organisms by slow and gradual modification be an essential tenet of evolution, I think we have shown that the bearing of palæontological evidences is decidedly contradictory to it, and that the theory requires evidence from other quarters, and that of overwhelming nature, for its support.

Finally, as a doctrine, evolution regards whatever is of the nature of cause as immanent in the world. It is "A mutual interaction of the forces possessed by the molecule of which the primitive nebula of the universe was composed," says Huxley. This part of the subject we cannot here discuss; but I may be permitted to ask, were we to conceive a supernatural force as in action in the origination of every new kind of organism, are not the facts, as far as known, such as we would expect:—unannounced,—conflicting with no law of nature already exhibited,—beginning in such form of matter as is common to all organisms,—passing through all the normal stages of growth exhibited by organisms of like kind, and only at the appropriate stages, before or at maturity developing such change, aspect and structure as to reveal the new idea expressed in its form, this latest change not being accounted for by any previous law of nature; and finally in its future descendants maintaining the stamp thus set upon it so faithfully as to show that it was born subject to the laws of nature but not alone by them?

In conclusion, may we not affirm as a general principle, which applies to the universe throughout its existence, that any phenomenon which can only be regarded as new or super-added to the already existing order of nature, requires for its explanation a super-natural cause? Such a cause alone explains what was created in the beginning, and, if thereafter the earth brought forth any *new* creatures, there was in such phenomenon the exhibition anew of the same unseen cause.

COLLEGE DISCIPLINE.

By Brother ANTHONY, President of Manhattan College.

School or college discipline is like all other discipline, and its perfection consists in the due proportion of authority and liberty. It does not consist in keeping a few boys quiet for a few hours of the day. True discipline takes hold of the man, forms his character, gives shape to his actions, shadows forth his course in life; it lays down the principles that will inspire a lasting respect for order and authority.

Authority is essential to order, and without order there can be no rational liberty. The principle of authority is the first essential in all good government; it is of God, and the idea of it is found in the souls of men.

In every nation and clime, in every state of society, from the wigwam of the savage to the stately halls of our national congress, this idea, this feeling of respect for authority is found; and, as it is in accordance with man's nature, it is as full of bright hopes for the future as it is of happiness for the present. Who amongst us is not the better for the feeling, the conviction that he can say, in all truth: "My Father is in heaven; He is the Almighty, the First and the Last; of Him are all things, and in Him is all happiness, power, authority."

Men are never content under an usurped authority; the conviction, however, is in them that where authority is legitimate, it is a duty to respect it; that it is as necessary for the well-being of society in general as for the good of each individual in particular. Therefore, to submit to it cheerfully, it must stand forth in the panoply of justice, it must bear the impress of the Divinity. In church or state, in the judiciary or the family — everywhere in the civilized world, when so presented, it receives the homage of the good and true.

As all men agree that authority is necessary, and that all have to submit to it in some way, why is it that we witness so much resistance to it in one shape or another? In most cases this arises either from the abuse of authority or from the ignorance of those who resist; rarely from the mere love of insubordination. To ensure good discipline or good order anywhere, the first essential is good government; an enlightened, strong, yet mild, and, above all, a just government. The love of justice or fair play is universal among men. This is the reason why, when we hear of or witness a brutal assault on a fellow creature, one whom we may have never seen, our whole manhood is aroused and all the indignation in our nature is

called into play to give expression to our disapproval. The man who understands these few principles, and who has the ability to put them in practice, has all the elements of the disciplinarian, the good, successful educator.

Government, no matter of what kind, to be a success, must be consistent. The educator or disciplinarian must have a mind of his own, a good judgment, a knowledge of character, and the energy required for his position. He must examine calmly the cases that come before him and treat his students as he would gentlemen of good social standing.

If a young man makes a mistake, it is certainly not good discipline, not good government, to apply in his case the highest penalty known to the code of the college laws. The weak, the narrow-minded disciplinarian will say, that the example in such a case will be productive of bad results, that the welfare of the other students demands severe punishment, otherwise discipline will be destroyed, the patrons will cry out against the weakness of the administration and the institution will suffer in consequence. He says this in good faith, he believes it, he is not to blame. He may be a good man, but he certainly is wholly unfitted for the high and holy function of teaching or training youth. The man whose soul is his own, and who has the courage of his convictions, will not be moved by any such considerations. He knows that students are, in general, correct in their judgment of the measures adopted for their good, and he knows too that they never complain of a noble act where authority, instead of crushing a promising youth, feels it no lowering of dignity, no sacrifice of principle to stoop and raise him up, whose soul is filled with shame at his fault, and whose determination to re-pay honorably the kindness shown him is the surest pledge of his future success.

The weak disciplinarian, because he is weak, will not do this; the strong man, the good disciplinarian, because he knows both the justice and the prudence of the act, does it regardless of consequences, regardless of what patrons or any others may say; and he does it because he is not moved by the whims of this one or that one, but by principle; and in so acting, he wins for himself and his mode of government the respect, esteem and love, not only of his students but of all right-minded men. But besides strength of character or firmness, the successful disciplinarian must be able to foresee the difficulties that may arise, and have the prudence and wisdom to prevent them, if possible; if not, to provide the best means of righting them. Vigilance, not espionage, will often enable him to foresee these difficulties, and prudence will furnish the means not only to right them, but frequently to make them the occasion of a salutary lesson. Thus, the prudent and wise disciplinarian moves in the right light; he acts from worthy motives, and is ever mindful of his exalted mission. He avoids precipitation, listens to advice, and is never above learning from any one who has any thing

worth communicating. He is equally careful to avoid anger and contention. He may be angry and sin not, he can justly show his indignation, when the manner or action of the students justly calls it forth. This kind of anger may be called the executive of justice, but it must ever be tempered with mercy. It resembles water in a clear glass vessel; it may become suddenly agitated, but in a moment becomes calm again, leaving no sediment behind.

The good disciplinarian, the successful educator, must be a man not only of steady character, but also a man of rare intelligence and unquestionable purity of morals. His is not the work of the counting-house, not that of the forum; it is the greatest of all works, the education of youth, the foundation of character.

Intelligence governs the world; but to be a source of power in the right development of the human heart, it must be true. God is truth. To form the character of the student, his intellect must be cultivated in accordance with the principles of truth; he must be made to see its beauty and harmony, its symmetry and force. To do this, is the noblest work, the grandest mission of man. There is no act more intellectual than belief in the First, the Eternal Truth. The well-cultivated intellect may be compared to a lens through which we steadfastly look at an object until we see lines and features that are not visible to the unaided sight. The naked eye cannot perceive them, but the power of the microscope reveals them; and as the powers of the microscope are multiplied, we see more and learn more of the object which still remains always the same to our natural sight. Thus it is with the intellect that has been developed in accordance with the principles of truth. In proportion to its development does it perceive in all the departments of nature, the order, harmony, dependence on truth, the oneness of the works of God.

If there be any, even the slightest imperfection in the lens, the object seen through it will be distorted. Precisely so is it with the intellect. The greatest aberrations come from the perversion of this faculty. Perverted intellect, especially in youth, distorts principles, judgments and laws, and one error in principle is more noxious than a thousand errors in practice. An erroneous principle is like a machine with misplaced or defective pinions. It is impossible to work it successfully. From one speculative error will proceed an endless series of practical errors.

In the primitive ages, the oriental mind, puffed up with a conceit of its knowledge, refused to learn of a Divine teacher, and instead, spun for itself endless visions, superstitions and genealogies concerning the nature of God and the nature of man. These intellectual Titans, having rejected the Divine teacher, became truncated men and stalked abroad headless and wholly unconscious of their mutilation. They abdicated the elevation and the dignity of human reason and in turning away from God they became slaves in rejecting the science of the Creator. Are not our youth of fair promise exposed somewhat to this fearful danger? Have we not a revival

of some of the dreams of the old philosophers to-day in the illumination of those who refuse any other light or direction than their own judgment and who loudly proclaim that it is all-sufficient for man's guidance, and all this because they are unconscious of the nobility of submission to a Divine teacher? They do not know the law-giver, and if they do not know Him how can they be expected to respect His law? What ideas can obtain with them of submission, order and authority?

And still, without correct views of his origin and destiny and of the Divine economy of nature, man is formed on a false model. He is unshaped from that original reflection of the image of God which is in him. He is deprived of light; and where light is not, darkness reigns. The human mind once deprived of the light of the Creator is filled with clouds of unbelief. It is perverted; it has lost its normal shape. It conceives and enunciates erroneous maxims, erroneous judgments, erroneous principles which end in erroneous and dangerous actions.

He, therefore, who do his whole duty by his students, must necessarily "*train them up in the way they should go,*" and guard them against theories that can serve only to blight their best and noblest aspirations. But he cannot communicate what he has not. If he would form his students to the habits of virtue, he must be virtuous himself; he must have fixed principles, a firm belief in God; otherwise he acts without sufficient motive, and will imperceptibly lead his students to do the same. The apparent good he is doing stands on a false basis and must inevitably crumble.

To be convinced of the truth of this position it is only necessary to compare the eastern nations with those of the west. What has given to the latter, to the Christian nations of the world their superiority in power and prestige over all others? Is it not that the principles by which they have been actuated are in sympathy with the deepest and truest sentiments of the human soul? Men are not always faithful to the principles which they know are right; but still, they respect them and on all questions of general interest are guided by them. The enterprise, energy and intelligence of the Christian nations are worthy the ambition of the highest intellect. No man, who has dispassionately examined this question, will deny that this superiority is owing to the sound principles and high culture of these nations.

Take two men equally amiable, firm of character, full of devotedness to their calling, but the one having a higher degree of culture than the other, while both govern successfully; while both are pleased and happy in the results they produce, the man of higher culture forms almost imperceptibly a class of men more elevated in sentiment, more self-sacrificing in their country's cause, more successful in all the walks of life. It may be said of such a man that virtue goes out from him. His ideas are clear, his judgment correct, his method of illustration so happy that he charms while he instructs.

The disciplinarian, or the educator, then, to be a success must be a diligent student. It will not do to go over the same grooves of thought and clothe his expressions in the same dress. If he would win the confidence of his followers, he must, by profound study, give variety to his conversation and have such a fund of knowledge that his disciples can say: "No matter what subject you call up, Professor N. is always at home and ever ready to shed the light of his magnificent mind on the obscure portions and make them as clear as the noon-day sun." The encouragement of such a man is to the student an incentive to the highest exertion. He leads the way; he shows the feasibility of what he says; his manner is a demonstration of what he enunciates. His position and reputation among the cultured fires the ambition, and his admirable ability is the sufficient motive in buoying up the student in the dreary hours of his sometimes, perhaps, disgusting labor. What grander motive can inspire the educator, the disciplinarian, to deeds of heroism and sacrifice, than to feel that he is a light to a circle of promising youthful and ambitious minds? He points to the empyrean and says to them: "Gentlemen, heaven is your destiny and while you are journeying thither, yours it is to explore the course of the stars, yours to point out the beautiful, the sublime in the thoughts of the noblest sons of men; yours to penetrate into the bowels of the earth and bring up its hidden treasures; yours to annihilate space and bring into close relation the most distant peoples, and yours to announce in all their beauty, in all their bright promise, in all their glorious fruits, the divine truths that teach men to love one another as brothers and to worship their heavenly Father as the author of all the blessings that we enjoy or can desire!"

Such a man must be respected and beloved by his pupils. His presence is a power, not only for advancing youth in their studies, but for giving a form to their character that is inestimable. The young man who happily has such a teacher early acquires habits of self-respect and self-control. He first admires his preceptor, and from admiration comes love and a desire to imitate him.

Men thus formed to the principles of virtue and action are too vigilant to be deceived by the false glitter of the charms of the world, and are too strong in virtue to be shaken by the whirlwind of passion. In college their superiority was manifest by their bearing, and when they enter the busy walks of life, they in due time become the leaders of men. They gather around them men of ability and work; their influence increases in proportion to the depth and breadth of their thoughts, the correctness of their judgment and the uprightness and firmness of their character. They inspire others with their own enthusiasm and almost always succeed in what they undertake. A few such men acting in harmony give a right direction to public opinion and impress their views so fully and widely that the influence of their lives is felt for ages. They never die, their spirit lives in the institutions to which they gave life, and posterity reveres their memory as the true benefactors of the race.

EDUCATION IN SMALL COLLEGES.

ROBERT B. FAIRBAIRN, D. D., LL. D., Warden of St. Stephen's College.

I invite your attention to a subject which has been made of practical importance in the last few years, namely, whether intellectual education can be conducted with success in a small college. Very much has been said in disparagement of small colleges. The distinguished President of Columbia College,* in the Address which he delivered before the Regents two years ago, gave expression to the feeling which is adverse to small colleges. The view which he presented has been repeated until it is supposed that a proper education cannot be attained in a small college, and that the student pursues his course in such an institution at a great sacrifice.

This view has been also exhibited in the disparaging remarks which have been made on the number of colleges which has sprung up in this country. It is often said, that we have nearly four hundred colleges, while in Germany there are only twenty universities. The inference has been invited, that each college pretends to be on an equality with a German university.

These two questions bear intimately on each other, because they involve a consideration of the proper work of a college and the relation of that work to the work of a university. I shall, therefore, first occupy your attention with the consideration of the object which a college has in view, and show that that work requires that colleges shall be multiplied; and then we shall inquire into the nature of a university, and see that a comparatively small number of *them* is required, because of the higher work which they have to do, and because of the older and educated men with whom they have to deal.

We are first then to inquire into the nature of the work, which a college is required to do. And I should answer, without hesitation, that its work is to develop the intellect, to draw out into conscious operation all the powers and capacities with which the mind of man is endowed, to whet and sharpen the mental faculties, so that we can make use of them in the affairs of life. We do not go to college for the purpose of gaining information, but to prepare the mind in order that we may receive knowledge. It is only when the academic education of a college is completed that the mind is in a

* EDUCATION AND THE STATE: An Address by F. A. P. Barnard, D. D., LL. D., L. H. D. "Many colleges, therefore, being interpreted, means feeble colleges; feeble whether as it respects the attendance they can attract, or the material resources they can command," p. 30. But he also says, "Now in what I have said of the multiplication of colleges I wish not to be misunderstood. I do not object to many colleges because they are small. If they are all equally good, and all really good, it matters not, educationally speaking, how many there are;" p. 32.

condition to receive knowledge and to investigate subjects, and to enter on the work of life in a profession.

To show this, I invite you to consider the age of academic education. Most of our colleges put the age of entrance at the completion of the fifteenth year. A person is only an immature boy at that age; the mind is only giving promise of what it is capable of doing; but it has not yet developed the capacity of doing the work of life. The mind, at that age, is not yet capable of bringing its attention down to any subject, and keeping it on the subject. The studies of the first year are such studies as an immature mind can deal with. In the latter part of the last century, and in the period preceding that, the entrance at college was put at a still earlier age. The two Everetts, who so distinguished themselves in literature and in rhetoric, began their college career at ten and thirteen years of age. A long list of our distinguished men could be made, who entered at an earlier age on their college studies, and consequently began their public life with powers brought into conscious operation. The tendencies of our day are to put forward the time of entrance, and to wait for more maturity. In some institutions of the country the requirements are so increased that it is not possible to enter on an academic education until a later period. But, still, the general requirement of our colleges is the completion of the fifteenth year, when the mind is still immature and undeveloped. In the French lyceum and the German gymnasium, which I will show do the work of our colleges, the age at which the student may complete the course is eighteen. He may then take the degree of Bachelor, and enter the university for his professional or scientific training; but the period which precedes this is an immature, undeveloped, uneducated period in which he is incapable of entering on the duties of life or of undertaking the work of a profession. In the English university-colleges the age of entrance is more mature than with us, but this arises from the fact that they have really no proper university, in which the student advances from the college of education to the university, where information is furnished for the mature and educated mind.

In our country there is a great desire to get into the work of life at an earlier age. There is a greater impatience with us. There is not the wish to spend so many years in mental training and development; and the more the time of entrance is advanced, the less number will you find of those, in our professional schools, who have gone through a collegiate course of training, education, and intellectual development.

The college is therefore intended to train lads, to develop their minds, to bring into conscious operation their powers and faculties; in a word, to educate them. The age at which they are received, and the years, during which this developing process is going on, can be used for no other purpose.

We are all agreed that the college is an intermediate step between the school or academy and the professional school. We presume in

most cases, that the lad, just entering college, has not yet determined on his future work. It is only at the end of the college career that the road begins to branch off in many directions, where he may take his choice. In the English colleges, where young men enter after a severe training at the great public schools and at an advanced age, there is allowed the choice of seven different courses. In some of our large colleges in this country the same choice is allowed; but there is this difference, that the same previous training of the public schools has not been enjoyed, and in our country they enter on this choice with immature and undeveloped minds. In the French lyceum there is the choice between the classical and the scientific course; and beyond this, which is afforded in the last two years, there is almost no choice. And the same is true in the German gymnasium. The reason of the choice in France and Germany is, that the opportunity of mental training may be afforded those who are not looking forward to one of the learned professions, but who expect to enter on a different career, which will require a knowledge of mathematics and of the natural sciences.

The collegiate course is one which is intended for mental training and development. The studies are those which will operate on the mind and bring into activity and conscious operation the faculties which must be made use of in the affairs of life. I may venture to repeat a story which the late Gulian C. Verplanck, whom many of us remember for his courtesy, his cultivation, his clear perceptions, and his great ability, told us in illustration of this very subject. He said, that a member of the British House of Peers being asked what benefit he derived from his academic training, which consisted of studies of which he made no direct use, replied that he derived this benefit from those studies, that they had developed the capacities of his mind, and had so whetted and sharpened his intellectual powers, that when any subject came up for discussion in Parliament, he could retire into the library and study the subject, and give to the House the results of his studies — that those academic studies had fitted him to deal with almost all subjects which came within the range of Parliamentary debate.

Reflect a moment on the mental qualities which are brought into operation in the various pursuits of life. What qualities of mind are they which are brought into operation when, as men, we go out into the world to deal with real life? They are memory, the attention, the judgment, the reason, the taste. The one who can exercise all these qualities in the affairs of life is the successful man. But the one who has extensive knowledge without these qualities, developed and brought into operation, will never successfully make use of that knowledge. He will not apply it at the right time. He will not see the relation which it has to the operations which he may have in hand. He will not draw from it the conclusions which will advance his present interests.

The Freshman or the Sophomore sits down to the study of Livy and Horace, of Thucydides and Euripides, and possibly the thought

strikes him that he will not go out into the world to talk Latin, or to expound works written in the Greek tongue. But he only entertains this thought, as he no doubt often does, because of his immaturity. As he turns over the pages of his dictionary and finds the root, and construction, and use of the word before him; as he takes his grammar and fits the word into the right place, he is performing operations which will come into play in all the important and dignified operations of life. He is cultivating the memory; he is comparing the word with other words; he is looking at the qualities which make this word expressive, and which separates it from other words; he comes to see how one word stands for a whole class; and the common qualities which bind them into a class; he begins to see how, as words have a specific relation, things also have a relation, and that a large part of knowledge, in the real operations of life, consists in learning the actual relations of things. He will see that the comparison, which he here makes, is the comparison which must be made in the affairs which will come before him in a learned profession, or in his connections in social life, or in the business operations of the world. His dictionary and his Latin or Greek book are therefore bringing into operation mental qualities which must be used, if he go into society, or if he mingle with men in the affairs of life.

So, again, let us consider what an influence language has on thought, on perceptions, on our daily actions. The man who will take care of his words is the man who is attending to the real relations and affairs of life. He knows what those relations are, because he has learned to express them — to express them accurately, and carefully, and elegantly. The study of language begets in his mind accuracy, and carefulness, and elegance. It helps, with other operations, to develop a careful, an accurate, and an elegant mind.

And this brings into view another quality which is brought into operation in the study of Latin poets and Greek tragedies, and that is the *taste*. What a great power in man is a cultivated taste, especially in a man who moves in society, who has relations with the cultivated men of the world. How often do we lament that our public men do not show a cultivated taste, and that they have not driven out all boorish defects by the refined and delicate taste which their communion with minds trained in classic literature ought to exhibit.

Then, again, when the young men of these two classes, which come first in our college course, sit down to the study of geometry, how conscious are the most of them of a difficulty which they attribute to the subject, and not to their own minds. They attempt to commit Euclid to memory, instead of understanding each definition, of perceiving precisely what a point, or a line, or a plane, or an angle is; of placing distinctly before their minds the qualities which make a line to be a line and not a plane; of grasping the difference between a parallelogram and a trapezoid; and of seeing so distinctly the difference between similar polygons and polygons similarly situ-

ated, that they will never confound them, that each will come up in distinct vision before the mind when the words are used. Why, half the difficulties of the world arise from precisely the same thing. In politics and philosophy, and in morals and religion, how often do men think that they are talking of the same thing, when they have no more distinct perception of what they mean, when they use the expressions, circulating medium, or unconditioned, or conscience, or grace, than the untrained and undeveloped Freshman does when he speaks of similar polygons. The teacher, who will exercise the patience to require each man in the beginning of his collegiate training to see and state clearly the propositions of geometry, to bring forward each step and to show its bearing on the proposition, to perceive how each argument is going toward the conclusion, and when the conclusion is reached, to recognize it as a fulfilment of what the proposition promised, is doing a great work, is drawing out some of the real qualities of mind which are called into daily operation in the ordinary affairs of life, is developing in that mind capacities which reach far beyond the relations of mere quantity, is teaching and training it to deal with all subjects on which the reason of man can exercise itself, is fitting it to dwell in a real world where it must undergo its probation for eternity.

Or, again, when the student advances into the higher classes and begins to look through logic and rhetoric, and mental and moral philosophy, into the operations of his own mind, and to study man as a being possessed of a moral and intellectual nature, he is again calling into conscious operation those very capacities which he is studying. He begins to see what the human mind is, and how it can be brought into connection with the affairs of life. Logic and mental philosophy teach him to look into his own mind, to study his own powers, to recognize what he is himself and what he is capable of doing, and to bring those capacities into relations to the affairs of life with which we have to deal. Those studies are means of self-recognition. They teach us, in early life, to know ourselves. They enable the young man to obey the injunction of the Delphic oracle, *γινῶθι σεαυτὸν*. They lead to that self-communion which is the real entrance to the realities of life. Often have we teachers been delighted with the remark of a bright young man, who had advanced into these studies, that he was beginning to know himself as had never before, that he was entering into a new world.

When we select, or when we keep to, the Latin and Greek languages, as the languages for collegiate study, we do so because we have in view the development of the mind. Those languages have a relation to all the languages of the literary nations of the world, such as modern languages do not. Those languages lie at the root of all modern thought, and give us the foundation on which our superstructure is erected. When the philologist exhibits the unity of language running back through the Latin and Greek; when he exhibits words, which we are using in the common affairs of life,

which have descended from those languages and which have been formed and fashioned by the processes of thought, he is showing, unconsciously probably, that they have a place and a power in education, which the mere inflexions of the German cannot give to it, or which does not exist in the French or in the English. Those languages are therefore languages for education, for bringing out into recognition the processes of the logical expression of thought, of the manner in which thought labors successfully to give itself utterance in words. We must get back near to the beginning in the study of language when we have chiefly in view the development of the mind, and the training of the mind in the processes which must be brought into daily operation.

And so in the study of natural philosophy, and astronomy, and chemistry, in the study of nature as it is exhibited in the various forces in operation on the surface of our globe as well as in maintaining the relations of the bodies of the solar system, we are bringing the mind into exercise in a new relation. Language alone would not educate the mind, because it would not bring out all the capacities which it possesses; and so the study of the natural forces as exhibited in the various departments of nature, will not educe all the powers of the mind, will not bring into conscious operation all the faculties which it must exercise. We use those only which will serve the purposes of education, and only so far as they will serve that purpose. We have not in view primarily the knowledge which is thus gained, but we look to the results which are to be achieved in gaining this knowledge.

And so it is with regard to logic and all studies appertaining to the mind. It is not for the purpose of making logicians or metaphysicians that we have recourse to these studies, but we adopt them, in a course of education, that the student may see and recognize his own powers; that he may see what the human mind is and what it is capable of performing; that he may see what the processes are when he thinks and when he reasons. It is not the art of thinking or the art of reasoning which a system of education has in view, but its object is to bring into recognized operation the powers, capacities and faculties of the mind when it thinks and when it reasons.

Now all this work is not the work of a university, but it is the work of a French lyceum, or a German gymnasium, or an English or American college. These are the studies in those institutions and ought to be the only studies. These institutions do not attempt to make linguists, or scientists, or astronomers, or chemists, or metaphysicians or logicians. The college undertakes to develop and bring into operation all the powers, capacities and faculties of the mind, so that those powers, capacities, and faculties, thus whetted and sharpened, can be brought to bear on any department of study with profit and with success.

This work is all a preliminary and elementary work. It is for the purpose of bringing those minds to maturity, of ripening them so that they can fulfill the functions which appertain to them. And

when I bring forward the example of the four most important nations of the world, the English, the French, the German and the American, and show that such is the process to which they submit the immature and undeveloped mind for the purpose of educating it, and bringing it to that degree of maturity that it can successfully exercise its functions, I think that there ought to be no mistake about the purpose and the processes of education. It ought to be seen that the work of a college is a preliminary work, which must precede the exercise of those powers in producing effects.

When the Dean of Westminster told the students of the Union Theological Seminary in New York, that "Whatever excuses we may make for inflation of style, it is a thing to be especially avoided and it is a fault into which American students of theology are especially likely to fall; that it very much diminishes your influence, that this inflated style is really one of the chief drawbacks which we in Europe have to our enjoyment of American literature" (Stanley's address, etc., delivered in America, p. 31): it might have been the display of a superior training and taste, but, *fas est doceri ab hostibus*, it was a plain truth put before us, that we are not thorough, that we do not carefully lay foundations, that we do not comprehend principles, that we do not master the elements and train and habituate the mind to comprehend fully and specifically the details of a subject. This habit can be acquired only in the preliminary education. I can illustrate it to you by an incident. The President of one of our colleges, an intimate friend of mine, asked the Warden of Winchester College what means they employed to train their scholars in writing such good English. After some moments of reflection he replied that he was not aware that an English composition had ever been required of a student in Winchester College, but they were particular and careful in the extreme about the translation of a Latin or Greek author into English; they never allowed a slipshod sentence to pass; they always required the Latin sentence to be rendered into good, strong, perspicuous and idiomatic English. This was the habit which was acquired in that college in translating; and he told my friend that he saw the results of this in their written English, and which the Dean of Westminster said he did not always see in the English which our countrymen write.

It is an impatience of the age, not of our country only, to get beyond foundations, preliminaries, elements, and to produce fruit. This is seen in Oxford. They have within a few years changed the course of study, so that at the end of the second year the student has the choice of seven courses of study; he may choose classics, or mathematics, or science, or jurisprudence, or modern history or theology. But the result of it is well put by the Warden of All Souls' college. This College is a society not of undergraduates but of graduates, who have gained fellowships and who now sit down to study as educated men. The Warden of that College gives the result of that choice at Oxford, as follows. He says, "Certain of our fellowships having been applied under the Oxford 'Reform Bill' to the pro-

motion of the study of history and law, we have been scrupulously careful in respecting such application, and in our capacity as examiners, of duly and faithfully discharging our trust. Now it has happened, very remarkably, that in no single instance has it been the candidate who has got his honors in history and law that has passed the best examination for the fellowship. It has, without exception, been the candidate who has got his honors in the classical school, and has afterwards, with a view to a fellowship in history or law, turned his mental powers,—so whetted, sharpened, trained, working upon its own sound basis—down upon the particular subject-matter with which he was preparing himself to deal.” (Archdeacon Denison’s *Notes of My Life*, p. 26.) This is most valuable testimony because it is competent testimony. It is testimony founded on accurate observation. And it shows that education must precede the devotion of our time to the acquisition of information and knowledge; and that the mind must be first educated, and that it is only then prepared to receive information with success. And it is more applicable to the colleges of our country than it is to the colleges of Oxford; for our students do not enter on their collegiate studies with the same accurate preparation. It is necessary, if we would successfully take up the study of law or history, that we come to the task with minds developed and matured and prepared by training to grapple with the difficulties of a subject.

Look into the catalogues of our professional schools and see how few of the students of some of those schools are Bachelors of Arts, and have come to the study of their profession with trained minds and developed capacities. The authorities of those schools, in many instances, show their appreciation of the necessity of previous training by requiring a year more from those who have not undergone the training of a college. The mere training in classics, and mathematics, and philosophy goes for something—goes for time. And it does go for time because those authorities, from sad experience, have discovered, if a discovery was necessary, that a trained mind in a medical school, as well as in All Souls’ College, Oxford, can acquire knowledge more quickly and more successfully than one which is not trained.

Now the question which I bring before you is this; whether mental training and development can be successfully conducted in a small college? Can the small college train the immature mind, educe the powers which lie latent, and bring them out into conscious operation? Can the college which confines itself simply to what is called the undergraduate course—to the four classes, embracing a period of four years, with no medical, law or theological department attached; with no scientific school in which partly a parallel course is instituted, with no parallel in the four classes—can that college develop the powers of the mind and bring them into conscious use, so that its graduates shall be able successfully to enter on the study of a profession, or on the study of any subject which they may choose?

If I have rightly described the course of study in a college and the purpose which it has in view, then that course will want very little variation. It is not the work of life on which the college student is entering, but only on preparation of mind that he may study those departments and branches of learning which appertain to the work of life.

If I was speaking to an audience who did not appreciate mental training, I might delay the course of my argument to show that mental development was a necessary preliminary to any real work. President Porter, in his work on College Education, (p. 72) has said that the college graduate made a more successful merchant's clerk than the one who had not had that training. And we should say so before observation. Why should he not be more successful? A merchant once said to me, with a sneer at college-bred men, that they could not make the calculations which his clerks could. But he forgot, or never knew, that with their training, with their mental powers brought into conscious operation, they could soon learn and master all the operations and know the reason of them, which his clerks had learned only as a matter of trade. The college-bred man is a trained man, with his powers and faculties at his command, ready to do what appertains to educated and trained men to do. And he ought to be able to turn the powers of his mind to any subject, and make himself intelligently acquainted with it.

Now this is our work. The college does not teach medicine, or law, or theology, or engineering, or any of the professions. A lad at the completion of his fifteenth year, when he is about to enter the freshman class, is not prepared to enter on any such studies; and it will not in any respect or degree advance his mental training or mental development that the professions are taught by the same body, or under the auspices of the same institution in which he is to be educated. That there are large libraries, and important observatories, and apparatus for extensive research into nature, and a society of learned men devoted to special studies in any of the various departments, will not at this stage of his education and development and growth in mental power and capacity, do really any thing for him. He has not reached a stage in which he can make use of these instruments, and of this influence, and receive the inspirations of science and literature. He is simply learning to observe, to classify, to hold the attention, to form the judgment, to reason, and to develop the taste. It is only when this is accomplished that he will be able to make use of the instruments of research which appertain to a university and the learned society which gives it power and celebrity.

Now the question is whether an institution—a college with one hundred students—twenty-five in each class as the maximum, cannot successfully do the work of training and development? Cannot a college with a less number, say twenty, do the work just as well? Will not the twenty or the twenty-five come into such relations in every study to which the attention is given in college; will they not be so

brought under the supervision of the teacher in languages, mathematics and philosophy that they will receive all the advantages, training, development and growth that are to be looked for in a college education? If you put into your freshman class forty, must you not make two classes of it? If you put into it one hundred, must you not divide it into five, in order that the members of the class may receive the benefits which they would not receive if the division should not be made? Are not our large colleges compelled to make this division? And is it not at once a concession to the doctrine of small colleges being able successfully to carry on the work of education and mental development? Will these one hundred students be any the less educated, their minds any the less successfully trained and matured, and their powers brought into any the less vigorous operation if they are brought together into one institution, separated from others, and maintained in a distinct society until the work of their education is complete?

The small college then, with one professor of Latin, with one of Greek, one of mathematics, one of logic and metaphysics, one of English language and literature, one of natural philosophy and astronomy and one of the modern languages, whose classes shall never exceed twenty-five; whose apparatus shall be sufficient to illustrate the text book; with no tutors, with no work turned off into the hands of inexperienced men, cannot the small college, thus furnished, do successfully and thoroughly the work of developing and training, of educating and educing the powers, capacities and latent faculties of the immature minds of lads from their sixteenth to their twentieth year? Cannot the small college do this work as successfully and as thoroughly as the large college with its classes divided, and put into the hands of young men, who are holding the office only for the nonce; who do not bring to the work the knowledge and the skill which the professor does who hears his class year after year? I do not say that the large college may not do the work, but my proposition is that the small college can do it and can afford the opportunity for mental culture in as great and in as successful a degree as the college whose classes may range from seventy-five to one hundred, and which may have united with it various departments for professional instruction and for original research into the operations of nature.

I should join issue also on the matter of expense.* A small college is no more expensive than a large college. When you have doubled your classes, when you have put into each fifty, you will want two professors in each department; you will want double the number of dormitories; you will have to double everything in your college if you propose to do the work as well and as thoroughly as you do it when you have only twenty-five in each class, except it be your chapel and your president. In Columbia College in 1869 there

* "When large expenditure has been incurred, which is necessary to equip properly a college for one hundred students, the college may just as well receive two hundred; and but a very moderate addition will suffice to fit it for one thousand." Dr. Barnard's Address, p. 80.

were 147 undergraduates and nine instructors. In 1879 there were 278 undergraduates and twenty instructors. The same is true of Harvard, Yale, and Princeton colleges: except in the case of these three where dormitories are required, they have increased in the same ratio. It will be found to be generally true in all colleges that there is one instructor to ten undergraduates, and of course the dormitories must increase just as the number of undergraduates increases. The additional instructors have been mostly tutors. But it will be found that in the four important colleges above named, "a very moderate addition" did not suffice to fit them for a number considerably less than one thousand.

And then I might call your attention to the number of lads or young men who can be brought together safely in one institution.

I shall not anticipate the subject to which your attention is to be invited this afternoon on college discipline. But I may say here that numbers have a very great deal to do with it, and that it is certainly easier to control one hundred than five hundred; and that the difficulty increases much more rapidly than the numbers. It was this very question which presented itself at the ancient University of Paris, and the name of the Sorbonne is associated with the necessity of providing care and culture under a proper discipline, for lads let loose on the town of a university. (Théry. *Histoire de l'Education*, vol. I, p. 361.)

In looking into the history of education on the continent of Europe we shall see that it was the unsuccessful attempt to bring together so many mere lads that the large number of lyceums and gymnasiums became a necessity. These are separate from the university proper, and are the preliminary schools for the university, as it is hoped that our colleges may become more in form and reality than at present, the preliminary schools for our universities or professional institutions.

Small colleges are the rule in France, in Germany, and properly in England. In our country we have apparently a different notion of a university, and we often identify it with a college, and then many are apt to think an American college is the same as a German or French university. I shall have completed my views of the subject when I shall have shown you that the French lyceum and the German gymnasium are nearly identical with an American college, and that they are more numerous than *our* colleges, and that a French university and a German university confine themselves to the work of our professional schools—the law school, the medical school, the divinity school and the scientific school. If you could bring these schools together under one government, so as to form one institution, you would then have what is called in Germany a university. When it is said, as it often is, that in Germany there are only twenty universities while we have 358 colleges, the inference is furnished that we have thus gotten 358 feeble colleges instead of twenty strong institutions like the German universities. It will greatly strengthen what I have said of the ability of our American small college to do the work of

education, if I show you that this comparison is misleading; and that the real comparison, and the only one which can be made, will show that both France and Germany have more small colleges than we have, and that their being small is one of the elements of their strength.

I have lying before me the "*Plan d'Etudes et Programmes de l'enseignement secondaire classique dans Lycées et collèges*," set forth by the Minister of Public Instruction in 1880 as a direction for the teaching of the year which has just closed. I have also lying before me the "*List of the Courses of Lectures by Professors, Privatdocenten and Readers in the University of Berlin*."

The French Lyceum and Communal college is divided into three departments. First, the elementary division; second, the grammar division; and third, the superior division. This last division covers the ground of our colleges generally. The programme of studies is much more minute than in our college catalogues and is intended as a guide to the teacher. It is the command of the Minister of Public Instruction to the professors of the lyceum what they are to teach. They teach all that is taught in any of the colleges of this country, and at the completion of the course the student, sustaining the examination, receives the degree of Bachelor of Letters. And then the way is open for him to enter the professional school of science, medicine, law, or theology. All these institutions in their totality, constitute the University of France. The various schools are not in France called universities, but they are the faculties of the university. There is supposed to be a lyceum in each of the eighty-four departments, and besides these there are 250 colleges, in which the same course of study is imposed. Thus there are in France, with a population, in 1878, of thirty-seven millions, 333 institutions where the same education is given as is given in our American colleges, and at the conclusion of which the student gets a bachelor's degree as with us. In Germany the gymnasium is an institution very similar to the French Lyceum. The divisions of instruction are similar, and lead to the same results, namely, that of a standing similar to the Bachelor of Letters or Arts, with a certificate which insures entrance to the university. The population of Germany is about forty-three millions. There are 333 gymnasiums.

In the United States the population is over fifty millions; the number of colleges, where the degree of Bachelor of Arts is given, and where the course of study is nearly the same with that of the French Lyceum and the German gymnasium, is 358. In France there is what we would call one college to 110,000, of the population; in Germany one to 130,000, of the population; and in the United States one to 140,000, of the population, so that in the United States we have a less number of colleges than either France or Germany. But if we take into account the area of these countries our number of colleges would be still less; the area of France being 201,900 square miles; that of Germany 212,091 square miles; and that of the United States, where there is a population ready to embrace the

advantages of collegiate education, of more than two millions of square miles. This would make the number of colleges in the United States still less than in either of the two other countries named.

To make this comparison still more apparent I will exhibit the number studying in the various faculties of law, medicine, theology, science and philosophy in the University of France and the number studying in the same faculties in the twenty-two German Universities; and those studying the same branches in the various professional schools in the United States. In France there are fifty-two faculties. In the German Universities, there are the four faculties in each, which would be equal to eighty-eight faculties. In the United States there are 124 theological schools, forty law, 102 medical, and thirty-one scientific schools; which would be equal to 297 faculties. In this respect therefore we greatly exceed either France or Germany. The number of students in France studying in the four faculties is 54,300; in Germany, 20,811; and in the United States, 18,500. Thus in France there are 1,000 to each faculty; in Germany 250 to each; while there are only fifty-six to each in the United States. While we then fall below those countries in the number of colleges, we have nearly twenty times as many universities, that is to say, institutions where the same branches are taught as in the universities of those countries.

Now it can certainly make very little difference in the effect of instruction whether the professor of law, in any of its departments, or the professor in any of the other faculties is lecturing to fifty-six or to 1,000 educated men, who are capable of listening and receiving information. But is it possible that a teacher can instruct in Latin, or in any of the studies of a college course a class of more than twenty-five? Are not all the professors and teachers before me ready, from experience, to say that they would prefer a less number?

I should like to insist on the necessity of confining our colleges to the curriculum of studies such as are intended for the development of the mind, to such as are imposed by authority on the French Lyceum. The introduction of so many different studies detracts from thoroughness, and the student goes out of college with a mind not formed to habits of accuracy, with no power of concentration, with no determination of getting at the bottom of a subject. This is the real difficulty of our collegiate education; and I think that it could be made manifest that it arises in a large measure from a kind of ambition in a college to teach a great many subjects, instead of teaching a few with accuracy and with thoroughness. It requires some courage to contract the course within such limits as will insure the cultivation of such habits. But I have got beyond the limits of the time which is accorded me, and must bring my paper to a conclusion.

The colleges of this State are under the supervision of the Regents. That supervision ought to be a great benefit to the small colleges of the State. It tends to keep them up to a work which is the standard of collegiate education. It ought to have the

same beneficial influence with us that the university influence does on the small colleges of Oxford and Cambridge. A "first" at Oxford and a "wrangler" at Cambridge may come from the college in either university which never has over seventy-five undergraduates. They belong to an institution which inspires them with a feeling of responsibility and of honor, which the University of the State of New York ought to inspire into all our colleges. That union under this one government ought to make our standard a uniform one. It ought so to bring us up in our work that we should never be measured or esteemed by the number of our students, but by the intellectual character of the men whom we send forth into the State to do the work of life. And our students ought to be made to feel that their education, their mental development, their intellectual capacity is in no manner dependent on the number, but only on the ability of the institution to bring into conscious operation all the capacities and faculties of the human mind.

HONOR STUDIES IN THE UNIVERSITY OF ROCHESTER.

By Professor J. H. GILMORE, A. M.

Every intelligent educator realizes the difficulty of making adequate provision for the best men in his classes. The tasks must be adjusted to the *average capacity* of his students; and about one quarter of the students in each class *could do* more work — would be better off, morally and intellectually, for *having more work to do* — than can be put upon them in conjunction with their class-mates. Nay, these exceptionally gifted, or exceptionally well-trained, students have a *right to demand* adequate provision of some kind for their intellectual requirements. Consciously, or unconsciously, they *do demand* it.

The necessity of making adequate provision for this class of men is, to my mind, the principal justification for the retention of the prize system in our American colleges. Beyond all question, that system fosters, to some extent, meannesses and petty jealousies. There *may* be some truth in the objection that it develops men in that direction in which they are already strong; and, hence, interferes with a symmetrical, well-rounded culture. *But*, it provides men with work who would otherwise fail of being adequately tasked. And it gives them an incentive to undertake that work — in the shape of pecuniary emoluments and academic honors — which some natures need.

For the sake of these advantages, we retain the prize system at the University of Rochester; but with certain restrictions and modifications which are designed to guard against some of its most frequent and most flagrant abuses.

1. Each student who desires to compete for a prize must, as early as the beginning of the second term, apply to the faculty for permission.

2. This permission will not be granted unless the student's average standing, *in all studies*, for a year preceding his application, has been at least 8.50, and unless his standing in the department in which he wishes to compete for honors has, from the beginning of his course, averaged at least 9.

3. Permission to study for a prize will be withdrawn, if the student's standing falls below 8.50 *in any department*, or if his absences in any department exceed ten per cent of the number of recitations.

The object of these regulations is, obviously, to make sure that only those men who can pursue prize-work without detriment to their regular studies take it up; and, further, to guard against any remission or irregularity in their regular work after students have undertaken to compete for a prize. The regulations are rigidly enforced and with the happiest effect in correcting some abuses to which the prize system is incident.

There is one other somewhat recent modification of the prize system as it exists at Rochester, which we regard as an improvement—if one conceives it to be the primary object of that system to provide work for the bright men of a class, and only a secondary, and altogether incidental, object to confer honor on those men who do that work most faithfully. We require, for instance, of our prize-men, not merely the reading of a Greek or Latin author, or of a mathematical text-book, but the independent investigation of some specially assigned topic. To make this point plainer, let me mention a few of our recently-assigned prize-subjects:

LATIN PRIZE (SOPHOMORE CLASS).

The ninth and twelfth books of Quintilian's *Institutes of Oratory*, together with an essay on "The Educational System of Rome during the Classical Period."

The first and seventh books of Lucan's *Pharsalia*, with an essay on "The Political Character and Aims of Julius Cæsar."

The tenth book of Pliny's *Letters*, with an essay on "The Provincial System of Rome under the Emperor Trajan."

The fourth book of Augustine's *De Civitate Dei*, with an essay upon "The Influence of Christianity on the Latin Language."

GREEK PRIZE (JUNIOR CLASS).

The Homeric Hymns, with an essay on "The Present State of the Homeric Question"; Plutarch's *Life of Solon*, with an essay on "The Constitution of the Athenian Courts of Justice"; selections from Fellows' *Modern Greek Writers*, with an essay on "The Distinctive Characteristics of the Modern Greek Language."

STODDARD PRIZE MEDAL (SENIOR CLASS).

Problems at the close of Loomis' *Analytical Geometry and Calculus*, with an essay on "The Mathematical Theory of Vibrating Chords"; Clark Maxwell's *Matter and Motion*, with an essay on "The Astronomical and Mathematical Principles involved in our General Land Survey." Forces variable in intensity and direction as treated in Smith's *Mechanics*, with an essay on "The Principles Involved in the Construction of the Telescope and its Use in Astronomical Investigation."

It may be said, in passing, that one motive for assigning these topics for special investigation was the hope that, in some instances, the essays thus elicited might prove the germs of valuable monographs, like Mr. Bryce's college essay on "The Holy Roman Empire," one of our Stoddard prize essays. The essay upon "The Telescope," by Mr. Thomas Nolan of the class of '79, commended itself so thoroughly to Prof. Rogers of Harvard college, who had been requested to award the prize, that he advised its publication, and it has recently been given to the public—without revision or modification—by D. Van Nostrand & Co., of New York.

The principal object had in view in our prize system is, however, adequately to task the brighter men in the class; and to task them

with work of such a nature as will train them to habits of independent investigation and clear statement and thus fit them better to perform their work in life. The custom of requiring, in addition to mere text-book work, the preparation of an essay on some specially assigned theme which presents considerable difficulties, seems to us best adapted to compass these ends.

In addition to the prizes already mentioned, the University of Rochester has a *Freshman Mathematical Prize*, for which examinations are held on such subjects as "Cubic and Biquadratic Equations, and Sturm's Theorem, as treated in Todhunter's *Theory of Equations*," or such text-books as Ray's *Higher Algebra*, and Pierce's *Elements of Logarithms*.

For the senior class there is an essay prize. Some of the themes recently assigned are: "The Place of Edmund Burke in Literature and Politics"; "The Social and Political Significance of the Vision of Pius Plowman"; "The Struggle between England and France for the Possession of North America"; "The Causes of Obscurity in Tennyson's Poetry"; "The French Pulpit in the Time of Louis XIV."

There are also two scholarships (of the value of \$300.00 each), awarded to the senior class for the best and second-best examination upon a French treatise on some economic theme, and a German treatise on some theme connected with the science of government. Such books have been assigned as Pradier Fodéré's *Principes Généraux de Droit, de Politique et de Législation*; Worms' *Histoire de la Ligne Hanséatique*; Doniol's *Histoire des Classes Rurales en France*; Merilhou's *Parlements de France*; Bluntschli's *Geschichte des Allgemeinen Staatsrechts* and the same author's *Allgemeine Staatslehre*; Roscher's *Geschichte der National-Oekonomie in Deutschland*; Bamberger's *Reichsgold*.

These scholarship examinations are upon both the subject-matter and the text of the volumes assigned, and are followed by the investigation, after graduation, of some specially-assigned topic in the department of political economy or the science of government—an investigation for which their special studies in French or German are supposed especially to fit the incumbents of these scholarships.

Many of the prizes offered by the University of Rochester are of slight pecuniary value; but they seem to answer the end for which they were created. They are *eagerly* contested, but as a rule, *good-naturedly* contested. In many cases, doubtless, the amount of work put upon them is equivalent to an additional daily recitation throughout the college year; but the health of the contestants does not seem to suffer from the strain imposed upon it, since the faculty would withhold—and frequently *do* withhold—permission to study for a prize from a student who, though intellectually qualified to compete, is physically weak.

In addition to the prize-work done in the University of Rochester, there has come to be a good deal of work done, outside of the regular work of the curriculum, without reference to prizes

—such work being simply recognized by honorable mention at Commencement and in the University Catalogue.

As in the case of the contestants for prizes, those who desire to study for honorable mention must obtain the consent of the University Faculty, which will not be granted unless a student is fitted to do extra work without detriment to his regular studies, and will be withdrawn if the applicant for honors neglects any department of study or becomes irregular in attendance. No honorable mention is given for studies which are not fairly equivalent, both in quantity and quality, to a daily recitation for one term in the department in which the student presents himself for honors. The student for honors is expected to pursue his studies under the supervision of the faculty and receive from them guidance and instruction at every point, no matter what the branch of inquiry he has chosen to pursue. The proficiency of those who study for honors is carefully tested by a committee of the faculty.

Practically, this system of honorable mentions is found to work admirably well — attracting to itself those students who are actuated by an enthusiasm for learning rather than a desire for honors; and, also, those who prefer the *certainly* of some *moderate* recognition of faithful work done outside the regular curriculum, to the mere *possibility* of more *striking* recognition. It is not open to some objections that are urged against the prize-system; and it renders it possible to recognize faithful effort in many more directions than the prize-system ordinarily covers. Indeed, for a college inadequately manned it renders it possible, while maintaining a regular disciplinary curriculum, to provide for the brighter and more enthusiastic men, an attractive system of elective studies, under competent supervision.

Such, at least, is the working of this system at the University of Rochester, where it has been found more difficult to keep men from undertaking extra work which they were not fitted to undertake than to attract them to it. Indeed, the appreciation of our undergraduates of the advantages of a professor's guidance in their reading and study outside of the regular class-room work has been such as to lead us definitely to announce that instruction will be given to students whose intention to study for honorable mention is approved:

By Prof. Kendrick, in Hebrew; by Prof. Quinby, in the Higher Mathematics; by Prof. Lattimore, in Botany; by Prof. Mixer, in Italian; by Prof. Gilmore, in Anglo-Saxon and Early English; by Prof. Burton, in Sanskrit.

This announcement contemplates a weekly recitation throughout the year in each of the studies named and a formal examination at the close of the year. That the announcement is no mere form may be seen from the list of honorable mentions conferred in the current catalogue of the University — a list which I venture to reproduce:

William F. Faber, and Frank W. Kelsey, of the class of '80, for a weekly recitation in Sanskrit throughout the year, and an examination on selections from the *Nala* and the *Hitopadeśa*, with studies in Comparative Grammar.

Irvin H. Rogers, of the class of '80, and Franklin N. Jewett, of the class of '81, for an examination on eighty-five pages of Bartlett's *Analytical Mechanics*.

John L. Margrander and Sumner W. Stevens, of the class of '80, for a weekly recitation in Sanskrit throughout the year, and an examination in Whitney's *Sanskrit Grammar*.

Franklin N. Jewett, of the class of '81, for an examination on Coulange's *Histoire des Institutions Politiques de l'Ancienne France* and vol. 1 of Dittmar's *Weltgeschichte*.

Benjamin L. Bowen, George W. Northrup, George H. Smith and Harmon M. Sage, of the class of '81, for a weekly recitation in Italian Grammar and an examination on one hundred pages of Foresti's *Crestomazia Italiana*.

That these mentions mean something, I am prepared to affirm from a personal experience with the class in Sanskrit which cost me ten hours of hard work each week.

To indicate the variety of this honor work, I may perhaps mention a few of the awards in other years.

Many students of course present themselves for honors on textbook work done in simple extension of the regular class-room work; but some strike out, for themselves, an entirely novel track. For example, honorable mention was given to a student who intended to become a physician "for an examination on the second volume of *Flint's Physiology*"; to another student, who had the ministry in view, "for an examination on Green's *Hebrew Grammar* and six chapters of the book of Genesis;" to another student, whose father was interested in a blast-furnace, "for an examination on the *Methods of Manufacturing Iron*"; to another student, of Scandinavian descent, "for studies in Danish and Old Norse."

Any one who compares the American college course of the present day with that of a century — or even a generation — ago, must be struck with the degree to which it has been varied and diversified to meet the demands of modern culture. Those demands are, however, still vigorous and imperative, and, at the University of Rochester, it has been found possible to do something to meet them by a system of elective studies voluntarily pursued by the students. There exists then, in fact — in the germ as yet, but a natural growth of the soil and showing signs of healthful development — a sort of "pass and class" system, in which the extra studies pursued by the honor men are not a mere *extension* but a substantial *expansion* of the regular curriculum.

It is upon the exceptionally gifted men in successive college classes that the reputation of their *alma mater* mainly rests. She owes them especial care and pains, for her *own* sake, as well as for

their sake and the sake of *the world at large*. The University of Rochester recognizes this obligation and seeks to meet it in those ways which I have briefly and imperfectly indicated. It is perhaps due to the generous enthusiasm, the personal magnetism, the unwearied effort, of her noble president that her system of honor studies, as distinguished from the ordinary prize system, has been made a success; but that it *is* a success, no one familiar with the recent history of the University can deny.

A BASIS OF METHODS OF TEACHING.

By Principal WILLIAM J. MILNE, Ph. D., LL. D., Geneseo Normal School.

When the common sentiment of a nation or of mankind is crystallized into a brief, terse statement we call it a proverb, and these proverbs stand, to the mass of men, in place of logical deductions and mature reflections. When once some maxim is found which inculcates that which men wish to believe, they cease to investigate and immediately give their assent to the statement which has been expressed in this terse and convenient form. Every phase of life and of conduct has a cohort of these expressions which may be used in its defense, and among the number we find a few which relate to the teacher. One of these most commonly found and most frequently quoted is: "Teachers are born not made." In scrutinizing the work and the measures of successful instructors it has been found that they have a natural aptitude for their calling and a natural inclination to engage in the work of training the young, and so there has been framed, in imitation of Horace's celebrated verse, the aphorism just mentioned. The maxim is undoubtedly true, and I suppose it is true that physicians, lawyers, bankers, farmers, blacksmiths and carpenters can lay as much claim to being endowed by nature with capacities, aptitudes and tastes suited to secure eminent success in their vocation as can the teacher. Notwithstanding the natural aptitude, the special talent, the eager desire, which is exhibited by certain workers in every trade or profession — notwithstanding abundant assurances of excellent character and indomitable industry in nearly all the varied employments of men *except teaching*, special training is deemed necessary to prepare the person to take responsible charge of his chosen work.

Until recently little attempt has been made at giving systematic instruction in methods of teaching. The sentiment expressed by the adage "teachers are born not made" has hindered investigation and precluded thought upon this theme. But at the present time the necessity of special preparation is being recognized to a considerable extent, and schools are being established all over the world whose avowed purpose is to impart that instruction and to give that training which is deemed necessary to prepare persons to instruct the young. The recognition of this need is only partial, however. Many who think that it is well enough to demand special preparation on the part of those who are to instruct *young* children, believe there is no need of training for those who are to teach young men and young women what are commonly denominated "advanced studies." They look upon methods of teaching somewhat as many look upon homœopathic remedies; they think they are good enough for children, but are of little or no use for grown people. If the methods were nothing more than devices for interesting or entertaining the young,

if they were nothing more than agreeable agencies employed for the purpose of enabling the child to pass his time pleasantly, opposition to them would perhaps be reasonable. But true methods of teaching — not simply ways of interesting or pleasing pupils — are based upon the laws of mental acquisition and development, and are worthy of the serious attention of the most learned educators everywhere, while the devices and tricks which sometimes masquerade under the garb of methods may properly be relegated to the attention and consideration of weary nurses and indulgent mothers. By methods of teaching is meant the rational adaptation of the subjects taught to the ends of teaching — the harmonious and philosophical arrangement of that which is taught so that the mind of the student may be thoroughly trained and furnished with useful and usable knowledge, and the adjustment or adaptation of the subject matter to secure these ends is as valuable to those of mature years as to those who are at the very threshold of school life. A proper method is not an unattainable personal influence over students by which marvelous results can be secured. It is a reasonable and scientific collocation of the forces designed to educate, and it is based upon the nature of the student's mental powers, the order of their development and the proper agencies and amount of exercise necessary to secure correct and rapid mental growth.

Such being the fact, there must be a great degree of similarity between correct methods, for the laws which guide in the method of teaching are independent of the instructor's management or direction. Indeed correct methods (if it will ever be possible to devise them), will be identical for the same reason that any two correct systems of psychological science, or systems of political economy will be alike when both are correct. If the philosophy of Sir William Hamilton is correct in all respects, any other system that is equally correct will be like it; if a method of teaching is exactly what it should be, the method adopted by all persons who are teaching the same subject, if it is equally good will be identical with it.

The fear on the part of many instructors of this identity of method has been a great hindrance to progress in the science of teaching. They say that they cannot be hampered by fixed rules or prescribed formulæ, that if we have identical methods we have machinery, of which we have already too much in our schools. There need be no fear of losing one's individuality however, for it is impossible that two persons by the same method should produce exactly the same results. Though the method is independent of the teacher's likes or dislikes, the results will be modified by the *personal* factor in his work. The variety of expressions and inflections, the enthusiasm or lethargy, the physical force or weakness, are as various as are the persons who teach, and consequently there is plenty of scope for individualizing one's work. The proprietor of a newspaper would not discard the best printing press because the pressman had not planned it or because he was unaccustomed to its use. A chemist might insist upon manufacturing acids and salts upon his own plans because he originated them or because he liked them, but methods

that would give better products at a cheaper rate would force him into humility or into bankruptcy. It is the same with the teacher. If he will not adopt the best methods because they have been wrought out by some one else, or because he is not accustomed to them, he should be permitted to devote his energy and his thought to other employments, and I have no doubt that experience in other fields of activity would speedily teach him the unreasonableness of his objections to uniformity in methods of work.

Lawyers are not slow to adopt good methods of trying causes or examining witnesses when they discover their value, nor do they seem afraid of losing their individuality by doing so; a physician who would not use remedies for the cure of disease in the prescribed order and in proper amount, on the ground that by so doing he had no scope for originality, would soon lose his practice and the respect and esteem of patients and fellow-practitioners. That teachers should sometimes display so much violent opposition to being guided in their methods of teaching by proper and invariable principles and laws is a matter of great surprise to those who are not of our craft. The discovery of correct principles of teaching and the arrangement of the matter to be taught in such a way that the greatest progress of the pupil may be obtained is, in the minds of thinking people, of more importance than the pampering of any man's egotism or indulging his self-importance. The problem which the true educator has before him for solution is, How can the mind of the pupils be properly trained and furnished? This he is to solve, independent of any prejudice or bigotry, and when he has obtained a satisfactory answer it is his duty to use every effort to secure that end.

It is, of course, true that the science of teaching is yet in its infancy, that the results secured are far from perfect and the methods wrought out far from satisfactory, yet investigation has given us some principles which may serve to guide us to something better than we now know. It must be discovered and decided what the ends of education are, and there must be a selection and arrangement of the forces fitted to secure these ends. Such a work is engaging the attention of many eminent men and we confidently look for a great advance as a result of their labors. There seems to be an agreement to a certain extent, regarding the ends of education, among persons who have given the matter serious thought—not entire unanimity—but yet what may be termed a *working* agreement.

Some progress has been made too in attempting to use the agencies at hand, so that these ends may be secured, but comparatively little attention has been given to the important work of selecting proper agencies. While men have by study and investigation discovered, as they thought, the objects to be attained by education; they have continued to employ the same forces to produce the result, which have been used for ages to produce results very different from those we now seek to secure. Whether such a course is best or is wise is a question that should receive the earnest consideration of every educator.

Two results which should attend good teaching are the development of mental power and the acquisition of useful knowledge. These are not *all* the results that should be sought, but they are all that need to be considered in this paper. It is evident, therefore, that the method of instruction must vary according as the instructor regards the development of mental power or the gaining of useful knowledge the principal object to be attained. If it should be his purpose to cause the students to become the possessors of useful facts, then it would undoubtedly be a wise mode of procedure for him to see that those facts were thoroughly memorized, it would be the utmost wisdom to require pupils to know perfectly the statements which embody these useful facts. But if on the other hand the facts are not useful, then the purpose of the teacher must be to secure the intellectual growth of the students, and the method to be employed must be very different from that employed in securing facts as a mental possession. Little attention should be paid to mere memorizing and the greater part of the pupil's energy should be expended in securing that mental strength which will enable him to grapple with all problems that may present themselves. Which plan is commonly pursued in our schools, whether teachers insist upon the pupils memorizing the statements found in our ordinary text-books or whether, as a rule, they seek to develop mental power is a question which need not be answered here, yet, while some might prefer that pupils should devote their energy to the attainment of knowledge and others to the development of mental power, we are confident that all will agree that that course of study and instruction is best which *will secure the highest degree of intellectual power and the greatest number of useful and usable facts*: that is, that a course of instruction which aims to develop power by employing the student's time and energy upon subjects that have an intimate relation to the work of life, is preferable to any that has not such objects to attain. We use the term useful in the sense of usable, because, while we recognize the value of all knowledge, come from what source it may, in giving power, confidence, and influence to its possessor, yet usable knowledge, information that can be turned to practical account in daily life is far more desirable for men in general than that which has only a remote relation to our present needs, circumstances or life.

To discover, therefore, what should be the end sought by our educational method we must ascertain whether the facts we teach are valuable, we must satisfy ourselves whether the information to be gained is usable, independent of the fact that it is impossible to dissociate knowledge and power, for knowledge that is usable, that can be employed to produce effects which will be beneficial to the world, is more valuable to its possessor than theories or facts that have to do with abstract speculations, however interesting they may be. What then is really the truth in regard to our courses of study? A very careful examination of the catalogue of studies pursued in our primary schools, our high schools, and our colleges will satisfy any one that few of the branches are pursued for the purpose of

acquiring usable knowledge. Indeed, only a small percentage of the facts acquired or that may be acquired in school has any value, if the value is to be determined by the quality of usefulness. While it is improbable and perhaps impossible that a curriculum of studies can be devised which will teach only useful facts and at the same time secure proper mental development and culture, it seems entirely within the power of educators to introduce more practical studies than some which are now occupying the student's time and attention. We may be pardoned if we urge teachers and those who are interested in the intellectual and practical progress of the young to take into serious consideration some reforms in the direction indicated. Political science is of more value than algebra or Greek, the proper study of the problems of civil government more practical than grammar or geology, an acquaintance with current events and history of more value than calculus or chemistry, a practical knowledge of our English tongue more productive of immediate good than Sanscrit or botany. No one can deny that the proper investigation of the principles of algebra and calculus, of Greek and geology, gives a desirable breadth of scholarly information and culture, and secures excellent mental discipline, but is it not possible to secure an equal amount of intellectual power and a much larger quantity of usable knowledge by substituting for some of the subjects taught in schools and colleges others that have a more practical character? It is not mere prejudice nor ignorance that leads men who are outside the circle of educators to speak against the impractical character of our instruction. They are, to a certain extent, just in their criticisms, and something ought to be done to adjust our curriculum of studies to the reasonable demands of the age. The average length of time spent in the study of geography, in the gathering of geographical facts, is eight or nine years. Some valuable results should follow from such an extended period of instruction, but we venture to say that the most of the facts which have been learned are forgotten in a few years after the book has been laid aside. Surely the method of teaching the subject should be changed or something substituted for it which will give better results. We believe it is possible by a proper arrangement of studies to accomplish in some instances the results in half the time now required to master them. There is a gain in many ways, derived from steady, faithful and persistent work, that is not at all commensurable by number of facts reproduced, there is a gain in scholarly culture which should be sought as a prize by every student, there is a gain in mental power and in the ability to investigate more thoroughly and solve more successfully the problems that may present themselves, but is every thing being done to accomplish the best results and bring the greatest returns for the effort?

If the conclusions arrived at thus far are valid, if it is true that the knowledge obtained in schools is largely valueless, except in the sense in which all knowledge is valuable, we have made substantial advancement in determining the method to be pursued in teaching.

If the facts we are teaching are of comparatively little value, our time can be employed profitably only by having some purpose beyond the attainment of the facts. We must seek the development of mental energy — the acquisition of mental power. The results of teaching must be manifested by an increase of knowledge or of mental power, or both, and since much of the knowledge after it is acquired, is not valuable in the sense of usable, the only alternative is to seek to arouse and train the intellectual faculties.

It must be understood that we have been speaking of the education of persons in general — not of the training of specialists, for in the respective departments of human industry and research there will be a demand for all the technical knowledge pertaining to all the subjects that are taught. The botanist needs a special vocabulary, the astronomer and engineer need to know algebra and the calculus, the philologist must know the science of etymology and general grammar, and the chemist must be familiar with the scientific symbols that have been adopted to indicate the elements of substances; but the value of these studies to the mass of men exists in their disciplinary power. The men and women who are not specialists make little use of their arithmetic, their botany, their algebra, their grammar or their chemistry; it is but rarely that they need to speak of racemes or bracts; it would be a curiosity to find a man who in ordinary business was obliged to complete the square so that he might solve a quadratic, or one who makes use of the fact that the angle at the center of a circle is double the angle at the circumference when both are subtended by the same arc. How many have made any practical use of their chemistry beyond the employment of an alkali on rare occasions to neutralize an acid? Perhaps we who teach are more inclined to over estimate the practical bearing of the facts we teach than are others who are able to look at our work impartially, and yet I am sure that all teachers even will agree that the facts which we teach are not important when compared with the development of intellectual power.

The principal effort of the teacher, therefore, should be employed in endeavoring to strengthen and stimulate the intellectual activities of his pupils. All the subjects pursued under his direction should be taught with reference to that end, not forgetting to fasten in the mind those truths that are valuable, and such as are necessary as a foundation for future progress.

The teacher must therefore base his methods upon principles deduced from the laws of mind. He must understand the nature of the mental powers, the order in which they are naturally unfolded, what agencies may be employed to awaken them, and the proper amount of energy that should be expended to secure the desired result. Such a view of the preparation needful for the teacher increases his influence and gives his calling greater importance with thinking men, and intelligent people are fast becoming persuaded that the work of the teacher demands not only some knowledge of subject matter, but also a thorough understanding of the processes

necessary to teach the young, in the proper sense of that term. We have, however, a large class of empirics — not, perhaps, consciously such — engaged in the business of instructing the young. They have no knowledge of the mental faculties, nor of any order that should be observed in their unfolding; they follow in the footsteps of persons as ignorant as themselves, assigning tasks and hearing the pupils say their lessons. In this enlightened age it seems as if such things ought not to be tolerated. Men are prohibited from engaging in other professions until they have, by practical experience under the direction of competent instructors, exhibited a degree of efficiency which gives assurance of reasonable success. Surely we are warranted in hoping that the time may come when such requirements shall be demanded from those who design to become teachers.

The limits of this paper preclude the possibility of discussing the nature of mind, yet we doubt not that there will be a general acceptance of the statement *that the path of the original investigator is more interesting, more fruitful in valuable results, and more conducive to the prosecution of extended research than any other path.* The pursuit of knowledge in this way awakens enthusiasm, arouses the spirit of investigation, and incites to earnest and persistent work. The order of mental acquisition, when this path is followed, is from facts and processes to laws and definitions instead of the reverse order, which is more commonly observed, from the simple to the complex, so that the complex is preceded by the elements which compose it, from the known to the unknown, so that new truths may be thoroughly comprehended; in short, this process of induction is exactly the process by which the student is to arrive at truth when he comes into the sphere of responsible activity, and this fact alone should commend it to every one. Ready-made answers, stereotyped rules and definitions may save the indolent student much mental effort, and the indolent teacher much labor in preparing himself to instruct, but we are confident that if this natural method were employed there would be much less indolence, much less stupidity and much greater interest in our schools than has ever yet been found. When the generalizations have been formed, when the truths have been established by this method, they should be thoroughly tested by a demonstrative method. We would have the students prepared by proper training to maintain what is true, to discover what is false, but the substitution of the one method for the other we believe tends to obstruct intellectual progress and is subversive of proper habits in the attainment of knowledge. The spirit and the methods of the original investigator rise as high above those of the mere observer of investigations as the spirit of the original artist transcends that of the servile copyist or imitator.

I have attempted to briefly disclose the nature and scope of methods of teaching, and I have enumerated some of the existing hindrances to their execution and objections to their adoption. I have referred also to the imperfection of even our most scientific

methods on account of the inferior and improper agencies employed to secure the ends of education. I undertook this work in the hope that something beneficial to our profession might result from such a presentation, that some improvements in our methods of instruction might be brought about by a discussion of this theme. At present many thoughtful and progressive teachers are too much like the alchemists of old — each working in his own laboratory — all quietly, some even with a degree of secrecy. Many have a fear that their methods by which they claim to be successful may some how come to the knowledge of their fellow-laborers. Chemistry as a science was the outgrowth of the investigations of deluded enthusiasts after there had been an elimination of the superstitions and of the personal elements in their methods of work, and we believe that teaching can never be a science, can never be a profession which will command respect, until our work has been tried and modified in a similar manner. We trust that professional reticence and secrecy will soon disappear, and that instructors will freely communicate their methods and plans of work and discuss their nature and value so that their worth may be discovered and a philosophical basis of teaching may be established.

THE RECITATION-ROOM IN ITS RELATIONS TO COLLEGE DISCIPLINE.

By Professor HENRY ALLYN FRINK, Ph. D., Hamilton College.

One of the special difficulties connected with the subject of college discipline, is the diversity of opinion as regards its objects and its limits. College discipline, it is said, is not an end but a means. The student is sent to college not merely nor mainly to be disciplined in the sense of government. He is there to enjoy peculiar advantages of education and culture; and hence should be allowed the largest freedom consistent with a right use of those opportunities. Thus a comparison is made between college life and school life.

During the student's earlier years, it is admitted that rules and regulations may be wisely enforced for their disciplinary effect alone.

But college government, it is claimed, cannot be put to such uses. The conditions of college life make it impossible. Even could the supervision be constant and immediate, as in the lower schools, the student has passed the period of life when it would be beneficial. The requirements of school discipline to which a willing obedience makes the boy more manly, would be childish restraint upon the college student.

Again, as says the objector, the power of self-direction is essential to future usefulness. Hence, if it is for the lower schools to train the student by direct and persistent exercise of authority to habits of prompt obedience and systematic movement and work, it is for the college to leave him sufficiently to himself to acquire the power of self-control and self-reliance.

But, however opinions may differ as to the general question of the object and limits of college discipline, all who have had to do with college work will probably agree that in whatever pertains to the recitation-room the student should be subject to authoritative rule.

The purpose of the student in attending college, it is said, is to enjoy certain advantages of education and culture. But these advantages centre in the place of instruction. Here, the student has an acknowledged duty; and by the manner of its performance is he to make his college course successful or unsuccessful. He may denounce the supervision which attempts to regulate his movements and conduct outside of the special place of instruction as an affront to his self

respect. Logical consistency, however, will compel him, according to his own theory of college life, to admit the justice and propriety of a vigorous exercise of authority in enforcing the demands of the class-room. With the risk of saying much that is common place, we shall therefore speak of the discipline of the recitation-room as a *preventive*, a *detective*, and a *corrective* of college disorder and dissipation.

Providing for a right use of a student's time is the best way of preventing its wrong use. When there is work to fill well his hours, and it is known that the work must be done, it will be the exception and not the rule for him to give much time to boyish disturbance and harmful dissipation. Nor is there reason for an objection to be made at this point against the class system. The bright, well prepared student, who is perhaps especially susceptible of temptation, need not have time to put to bad use, while the dull boy, not so well prepared, nor so likely to go wrong is overburdened with work. Because members of the same class, there is no good reason why the daily instruction and examination of each should not be varied according to the different capacity and attainments of the student. The brighter, and better prepared student ought always to be held responsible for a higher rank in scholarship than the boy of slower mind and poorer preparation. Each day's examination may show him, by its peculiar questions and criticisms, that finer distinctions, fuller explanations, a larger range of illustrative facts, a more elegant expression and finished translation are to be required of him than of many of his classmates.

Without any formal statement, a skillful instructor will make it plain to such a student that his work to be satisfactory must be in keeping with his peculiar gifts and advantages irrespective of what is done by other men.

It need not be repeated that when students of this type are kept busy, one of the most fruitful and dangerous sources of disorder is brought largely under control. The question of college discipline is not made so perplexing by the dullard nor the vicious student. It is the man of recognized ability, quick wit, winning ways and apparent disregard of the honors he might so easily gain, who throws around disorder and dissipation a glamour, and makes the evils of college life popular and attractive. Time left idle upon the hands of such a student, is not only full of peril to himself but to the good order and good morals of the institution. If the hours of the student can be profitably filled by other means than an arbitrary assignment of work, better still. Earnest, able, enthusiastic teaching will often direct his spare time toward voluntary, but often highly useful occupations. Where the leading minds of a class are brought under such influence the irresistible power of popular sentiment takes side at once with what is scholarly and worthy. Regular and systematic work, even when the result of coercion, is, with the young, a moral force; but a still surer preventive of evil is work which has its inspiration in an enthusiastic interest.

But, if such means of preventing wrong doing be exceptional, it ought to be in the power of every instructor to preclude the indolent and indifferent student from determining popular opinion as regards the kind and measure of work to be done in any exercise. Whatever authority the college has over the student should be here felt in its full force. Let a recitation or exercise be habitually treated with indifference, if not disrespect, and the evil, subversive as it is of good scholarship and good order in the particular instance, will not rest with the recitation and exercise so dishonored. It will be a prolific source of disorder and bad manners in general. Yet, may it not be asked, whether college discipline always does its duty in such instances? Will not the inner history of some institutions reveal that in certain directions this state of things has been tolerated for years? Other disorders, it is safe to say, have received due attention. Faculty meetings have been called again and again to help protect surrounding orchards, to guard the precincts of a neighboring seminary from untimely intrusion, or to punish the original use of some straying quadruped; but the disrespectful treatment of a prescribed exercise of the college which has so helped to break down the student's sense of propriety and regard for authority, has gone on, from year to year, until it has been allowed to add to its present power for harm the almost unconquerable force of tradition.

But this subject has two sides. If a neglected or disorderly exercise may infect the whole college with a disposition to insubordination; so may an hour in the class-room that has been full of interest in its instruction and of the spirit of gentlemanly demeanor in its conduct, be an inspiring influence to all the other hours of the day.

An important element in college discipline is the bearing of the student towards his instructors. The disposition to test in the recitation-room and elsewhere the inexperience of a young professor, is not unnatural. But this is not the only form of the offense. Student sympathy is quick and ardent, but not always discriminating. One of their number, of malignant spirit, believing or pretending to believe, that he has suffered some injustice, will so work upon the minds of others as to make them seize any opportunity to annoy and harass a tried and valuable officer. But only when college discipline is known to be remiss, will the evil long survive its birth. In fact, when discipline is prompt and efficient, public sentiment will have been so educated as either to prevent the possibility of a gross offense of this kind, or on its first appearance to apply its own swift and sharp penalty.

Neither does it indicate, as some seem to think, an over-wise sense of dignity, to regard seriously the bearing of an insolent student. It is a more facetious than judicious theory which has been advanced that a little misconduct of this kind, if not done in malice, may perhaps prove to be even an advantage to the instructor. Possibly the thoughtless and careless may make a college officer the object of

their sport and annoyance, day after day, and yet cherish for him a kind feeling. They may, indeed, give tangible proof of that kind feeling by the formal presentation of some valuable testimonial at the close of their connection with him. Years later, the same students as alumni of distinction, may laugh over their treatment of the professor, and speak of it in the hearing of younger men in no very severe terms. Still, college discipline has suffered a wrong. The evil influence is apparent. It needs no statement in detail. For such conduct there can be no defense nor excuse by those who have the high interests of the college at heart.

Nor as a rule ought an offense of this nature to be regarded as merely a personal matter between the instructor and student. It is not only a direct blow at the authority and usefulness of the officer himself, but of every other officer of the institution.

The governing power of the college, therefore, owes it, not only to the instructor and student immediately concerned, but to all its members as well as to the whole body of students, to treat with such severity the first indication of any thing like discourtesy in this respect as to show the extreme peril of its repetition from any other quarter. It is not too much to say that if the recitation room be kept free from the beginning of this evil, the instances will be rare of its appearance elsewhere.

All that has been said concerning right discipline in matters relating to the class-room as a preventive of general disorder is, we think, familiar. The line of remark, however, will bear the emphasis of repetition. For years, the writer has been accustomed to look over, from term to term, many of the undergraduate publications of the different colleges. These papers and magazines naturally report much of the internal condition of the institutions represented. The report is often of pleasant features of college administration; but, sometimes, of its troubles. Reading with the light of experience between the lines, and making allowance for the undergraduates' way of looking at things, the writer has been impressed with the fact of the very large proportion of difficulties that have had their rise in some failure of proper discipline in the exercises of the class-room.

It is true, that in the form ultimately assumed by the trouble the remedy often seems not easy to suggest. But as often may it be seen that the preventive would have been a very simple course of action, if carried out promptly and vigorously in the proper place. That in the hours of recitation alone, instruction can be so efficient, and the examination and oversight of the student as to work, manners and morals so complete, as to do away with all other forms of college discipline, is not assumed. Far from it. But much has been already accomplished. When the requirements of the recitation room have been satisfactorily met; and when these fail as a preventive they may do good service in college discipline as a *detective*.

The degree of special restraint and supervision which shall attend the student's working and leisure hours is a question which lies out-

side of our part of the subject. The American college system, however, takes for granted that the student while in actual attendance is *never* to be exempt from some such restraint and supervision. In the rigor of their discipline in this respect colleges differ; but all following the college system as distinct from the university system, claim to exercise this supervision in some form or measure.

By many it is urged that the attempt should be abandoned. The system, so the argument runs, fails to secure its ends. If rooms are to be visited, the visits cannot be sufficiently frequent and searching even to appear to be a restraint; if study hours are prescribed, the regulation is as a matter of necessity largely left to enforce itself; if absence from town is forbidden within certain bounds there are no effectual means to prevent violation of the law; if severe penalties are attached to participation in vice, there can be but little real guarding of the student from its indulgence.

Again, it is claimed that the system is as harmful as futile. If it does not cause trickery and falsehood, or puerile evasion, it checks and retards the healthful growth of the self-sustaining and self-directing elements of character. Still again, it is objected, that the influence of this form of restraint has an unfavorable effect upon the mutual relations of instructor and student. It compels the college officer to assume in an offensive way a disputed right. It thus arouses an antagonism which detracts from his largest usefulness and best influence.

It is not our province to answer these objections. They are not without force; and their consideration may well form a part of the treatment of the general subject of college discipline. One remark, however, may be made in passing. Whatever conclusion the advocates of a larger freedom for the student may draw from this line of argument, the conclusion of the parent is likely to be one not so unfavorable to restraints in college life, *as to college life* itself. If our colleges cannot give to the boy of sixteen or seventeen any further watch and care than that of the hours of recitation, the parents will not be few who will say, "College is not the place for my son."

Still, the discipline of the recitation room, if not in itself wholly sufficient, may greatly help to relieve the discipline of the college elsewhere of some of its most objectionable elements. The student is not so much annoyed at the authority which requires that he shall put his opportunities to proper use, as he is at the means often employed to detect their improper use. Whenever the method of detection assumes a personal form, it becomes most offensive. But when the student sees that his wrong conduct has been brought to light by the ordinary workings of a well-ordered system, rather than by the seeming over-diligence of a college officer, he will miss his usual cause for complaint and traditional escape from self-condemnation.

That the discipline of the recitation-room, if faithfully administered, may soon detect all that is glaringly wrong at other times and places, is plain. If here, the student has been found to be regular,

satisfactorily prepared, interested and respectful, showing in his countenance and general bearing the recognized marks of a moral life and healthful habits of work, it may be inferred without other proof that his room is not improperly used; that study hours, as to the spirit if not to the exact letter of any sensible requirement, are observed; and that no extended absence from town, nor flagrant violation of good morals, has taken place. When this is said we presuppose sufficient work of the right kind to keep the student's time well occupied; we presuppose recitations so conducted that the student shall recite daily in each branch of study; we presuppose methods of instruction and examination which shall adequately test the honesty and thoroughness of his preparation; we presuppose with respect to the instructor that knowledge of human nature and that degree of moral sensitiveness, which can judge of the spirit and moral tone and habits of the student by his characteristic intellectual representations and personal bearing. What is learned in this way of the student is plainly a matter of open observation. On the part of the officer, it involves no compromise of personal dignity or reflection upon the most delicate sense of honor. The discipline here seen to be required, whether it be in respect to grade of work, degree of interest, lack of manliness and scholarly courtesy in general deportment, is natural and legitimate, and cannot be deemed by the student, arbitrary and officious.

But the discipline of the recitation room may often do more than detect ordinary cases of deficiency and misconduct. The special deflection, however carefully concealed, is never safe from its scrutiny. It may not at once point out the offender, but it often directs suspicion with great accuracy.

It may not alone have exposed the secret course of evil, but it often furnishes the important clue.

The power of a good disciplinarian in the lower schools rests largely in his knowledge of his pupils. Let the college officer study the student as carefully and know him as thoroughly, and he need not be long ignorant of much that is wrong.

Especially is this true with respect to morals. The young show early, as has been intimated, by their countenance and bearing, any moral change in life.

With this change will be a necessary decline in scholarship. If interested in the student the instructor ought not to wait for some open and disgraceful offense to reveal the transformation.

To the faithful officer the signs are apparent by which he may recognize the evil in its first stage before the time for its correction is passed.

To speak of the influence of the recitation-room as a *corrective* of college disorder and dissipation involves reference again to the moral and disciplinary effect of work. How often is the turning point in the career of many a student his entrance into some new department of study that has for him a peculiar interest and attraction. A revolution, not only in habits of work but in tastes, deportment, and morals is frequently recognized.

The activities that for want of a happy and commanding direction had turned into wrong channels, now serve as eagerly a legitimate and useful end. The marked changes in spirit and manner that often seem to attend the passing from class to class, we think are frequently owing more to changes of subject of study and methods of instruction, than to the arbitrary transference from sophomore to junior, or junior to senior year. So, giving to college life at any time a new interest by varying its subject and method of study, will be a helpful means of counteracting wrong tendencies in some other direction. We have seen a college carpenter suddenly relieved from extra and peculiar services, by simply an announcement of attractive themes for competitive composition. The influence that changed so much activity from a mechanical turn somewhat questionable to an appropriate literary occupation, was probably not recognized even where it was most effective; but it was no less successful as a corrective of the annoyance. We shall not pause to note the argument suggested in favor of some latitude of choice in subjects to be studied. But, if in a disciplinary point of view, there are reasons for making a part of the college course optional, there is also much to be said for holding in the main to a prescribed curriculum.

It certainly supplies a guide and restraint which are especially needed to keep the student to systematic habits of work and action, and is as much of a moral as a mental discipline.

How far a professor may with good results exert directly his personal influence in helping to correct the habits and morals of a student, depends upon his own characteristics as a man, and the relations between him and the student. Aside from difference in age, position and habits of thought and feeling as well as the traditional prejudice against intimate relations between the two, a necessary daily assumption of authority by the instructor serves as a natural restraint upon the student, and tends to keep him apart from his instructor. Yet, if in one way the recitation-room is a barrier to helpful relations, in other respects it may promote them. Here, may be indicated most naturally, yet effectively, that personal interest and appreciation which invite confidence, and secure in return kindly feeling. The encouraging recognition of work well done which, without flattery, every skillful instructor knows how to give, the appreciative consideration of the student's difficulties, and delicate adaptation of instruction to his peculiar needs, will assure him that the professor is doing more in his behalf than simply meeting an official responsibility.

When it is understood by these and other unmistakable signs that his instructor is seeking at all times and in all relations to be his friend and helper, the word of encouragement or reproof privately and directly spoken will not be without weight.

There has been no advocacy in this paper of doing away with active and immediate supervision wherever and whenever demanded by circumstances. So long as the American college has to do in part, if not in whole, the work of the English public school and the

German gymnasium, it will not be well to grant the student university freedom. Yet the power of this personal influence is not overvalued when it is claimed that, in most cases, a few conversations, free, confidential, kind and judicious at critical periods of the student's career will do more to guard his morals, direct his tastes, and shape his character than all the police duty and superfluous supervision which a college officer can crowd into the four years.

The limitation of our subject, as well as the close of our time, will not permit a discussion of the difficulties which usually receive so much attention when college discipline is considered. The class of disorders, known in general as "hazing," the defiance of college authority in the form of class combinations and revolts, as well as all noticeable offenses against what is orderly, decorous and scholarly, ought to see their end, and without much delay, if the student is not to fail in learning what ought to be some of the most important lessons in college life. It is understood that in many instances these troubles require special treatment. The form they assume is peculiar, and the discipline must be adapted to the circumstances.

Thus to *prevent* or *detect* and *correct* these evils there will be often need of something more than has been proposed.

Yet examination will show, we believe, that when these troubles are most common and persistent, the college has failed to do its duty with reference to these familiar matters which we have considered in speaking of the recitation room in its relations to college discipline.

RECENT PHYSICAL THEORIES IN THEIR BEARING ON THE TELEOLOGICAL ARGUMENT FOR THE EXIST- ENCE OF GOD.

By Professor BENJAMIN N. MARTIN, D. D., L. H. D., University of city of
New York.

The great argument for the existence of an intelligent Creator from the indications of design observable in nature, which, after so many intimations in the writings of Plato, Aristotle, Cicero and others among the ancients has been so fully presented in the numerous and extended discussions of modern writers, seems to have culminated in the lucid and ingenious reasonings of Paley, the standard volumes of the Bridgewater Series, and the elaborate treatises on Theism and Anti-Theism in our own day.

Such an extent of research, and such a body of argument as these works supply, might well seem to have exhausted the subject. Nowhere could the theistic writers expect to find other fields broad enough to extend the scope, or rich enough to furnish more striking illustrations of an argument so weighty and comprehensive as this had become. It is therefore of the highest importance for us to ascertain, by a careful comparison with philosophical, and especially with scientific, standards of thought, the actual value of their results.

The teleological writers had in the course of several generations accumulated such a body of significant and expressive facts, ranging over so wide a field of observation, and indicating such a felicity of adaptation between things in nature and the ends actually subserved by them, that for a long time all reply seemed hopeless, and all objection futile. Whatever reductions our advancing science might make in the number of the facts adduced, on the ground of error or misconception, still the number of unquestionable examples of minute and complex adjustments in nature, and especially in the phenomena of organic life was so vast, and the character of them was so striking, that no other explanation of their origin than that which referred them to the will of an intelligent Creator seemed, with the existing philosophy, rational, or even possible.

That philosophy was however based—in accordance with what was then the general, not to say the universal belief, both of the common and the scientific mind—upon the idea that a species is something fixed and unchangeable. The progeny, it was said, resembles the parent. From generation to generation, through all the ages of history, there has been no observed change. The domestic animals have continued the same since Noah received them into the ark and

since they were mummied, sculptured and painted on the monuments of ancient Egypt. This is not only really, but even formally, the basis of Paley's reasoning. He observes that the fact that an animal form is derived from a long succession of parents, does not in any, even the smallest degree, account for the varied and exact indications which it displays of designed inter-adjustment of its parts and members to each other; and hence an indefinite, or even an infinite, number of successive generations, would not account for such adaptations. He speaks as follows:

"Our going back ever so far brings us no nearer to the least degree of satisfaction on the subject. If the difficulty were diminished the farther we went back, by going back indefinitely we might exhaust it. Where there is a tendency, or, as we increase the number of terms, a continued approach toward a limit, there, by supposing the number of terms to be what is called infinite, we may conceive the limit to be attained; but where there is no such tendency or approach, nothing is effected by lengthening the series."

It will be perceived that in thus laying down the foundation of his argument Paley distinctly bases his reasoning upon the fact that there is no progressive change in a species through any number of successive generations. The latest link is a precise reproduction of the earliest. The species is fixed; it is without progressive development, or observable change, in that whole period of its history which we can observe. On that theory, and as long as that continued to be the scientific view of the subject, his argument was unimpeachable.

Of late however this alleged identity and fixedness of species has been called in question. The doctrine of evolution, as presented by Mr. Darwin, has seriously modified this fundamental postulate of Paley's reasoning. It becomes us therefore to take a survey of our position, and to ascertain on what ground the teleological argument is to stand, now that the changed conception of scientific thinkers has stricken from beneath it the foundation on which hitherto it has been so confidently made to rest. What is henceforward to be the relation of that profoundly important theistic argument to the new views which have first shaken, and at length largely supplanted, the opinions which had been accepted as fundamental principles of science through all preceding periods of scientific history?

In looking around us on the world in which we live, two great and comprehensive aspects of it force themselves on our attention — the one, a boundless multiplicity of objects; the other, a ceaseless current of events. The former are for the most part fixed and permanent; they remain ever the same. The mountain, the valley, the sky, the landscape show little change from day to day. But the events which take place around us are evanescent and fleeting; movements and changes rapidly succeed each other. The seasons, the wave, the breeze, the cloud, are seldom the same from hour to hour. The sunset on which we gaze with delight, fades, changes, and is gone, even while we gaze.

These two wide and comprehensive classes of phenomena we distinguish broadly from each other. The former, that which seems permanent and stable, we call *matter*; the latter, that which is transient and changing, we call motion; and matter and motion make up the visible universe.

The permanence and stability of matter are little apt to awaken wonder, or call forth inquiry. The natural inactivity or immobility of matter — which moves only as it is impelled by external forces — sufficiently accounts for its seeming permanence. We need no explanation of the fact that a lifeless mass remains as it was. But what is the cause of this ever-recurring motion? Something within us asks a cause for each new form and phase of things, for each departure from a previous condition.

As we trace facts scientifically, we find that a vast proportion of physical phenomena belong to this class — they are ultimately facts of motion. The laws and methods of this motion seem very varied and different; and science naturally attributes each particular group of such phenomena to its own distinct and separate cause. Each forms the ground-work of a definite and peculiar science. The science of physics, or natural philosophy, discusses those movements and tendencies to motion which give rise to the phenomena of weight and pressure; that of acoustics investigates those tremulous movements of the atmosphere to which are due our sensations of sound, while that of optics studies the infinitesimal vibrations in which the phenomena of color and light originate. All our sensations of taste and smell suggest other and similar motions of particles floating in solution, or diffusing themselves through the air. Thermotics inquires for the laws which govern the distribution of heat; chemistry investigates the molecular movements by which bodies combine and again decompose; electricity, in its several forms, co-ordinates the phenomena of that peculiar and most varied attraction between the particles and the surfaces of bodies. Mineralogy classifies the modes in which particles aggregate into crystals, and describes the infinite varieties of beautiful forms thence arising; biology explains the subtle and minute movements by which the atoms of inorganic matter build the wonderful structures of plant and animal life; while astronomy groups, describes, measures and computes the rapid and vast movements of the celestial orbs.

The facts which relate to the social state are, more conspicuously perhaps than those of any other science, facts of motion and of activity; and sociology has for its great aim to determine the laws which govern the movements and the progress of communities and nations.

All the facts of science are thus, either primarily or ultimately, facts of motion; and science, in its widest reach, is the arrangement of these facts under their various laws, and the co-ordination of them into systems of knowledge.

All motion, however, implies a something to be moved; and hence, amid all phenomena of movement and change there must of

necessity be a substance which remains permanent and unchangeable. This too, science must recognize and admit. Unable to reach it by the same method by which she reaches phenomena, she yet finds it an inevitable element, if not of her observation at least of her reasoning, and of her conclusions. There is a science therefore of the facts, as well as of the phenomena; of the substance, as well as of the properties and the laws. We have thus a descriptive enumeration — without which science would be utterly lost — of the several different kinds of matter — now some seventy in number — an account of the various quantivalences and combinations of the atoms which thus combine and act; of the three forms, solid, liquid and gaseous, and now of a fourth form — the radiant — in which they exist; of the analysis, chemical and spectroscopic, of these into their elements; and of the permanent and fixed character of these ultimates of the physical universe.

We have then two great forms of science, one of which deals with the fixedness, and the other with the flow of nature, one with matter, and the other with motion. One describes the stability and permanence, the other the changes and motions of nature. They are substantially the dynamic and the static elements of the world.

Underlying both these great departments of reality, is the comprehensive fact of force. Matter and motion are much; but they are not all. They form, as I have said, the visible universe, but the visible is not the whole of the universe. They need for their explanation another fact, that of force, without which neither of them is conceivable. In order to account for the motions, and to explain the matter of visible things, science freely and confidently postulates another form of existence which is real as these, and still more important, though invisible — the more fundamental fact of force. They are both manifestations of force.

All matter has and must have force. It is, by its very nature, a resisting mass; and this fact of resistance is an exhibition of force. If any force acts upon a mass to move it, or to change its place or state, it resists the change. It opposes to this outward force an inward force of immobility, which we call inertia. If any force from without presses its particles together, it resists the compression. At first the resistance is moderate; the parts come nearer together with more or less slowness. Then a greater resistance is felt; the compression becomes more difficult. At last we reach the point where practically the compression ceases. It cannot be carried further. We reach the limit of our power; and not only this, but we learn from our very conception of matter as a reality, that there is an absolute limit to all power. The substance cannot be compressed out of existence. It must and will forever remain a resisting mass. The fundamental power which a particle of matter possesses of asserting itself, and of maintaining its reality against all the other forces of the universe, guarantees its permanent existence, and forms its characteristic feature as a material thing.

These then are the great elements of science — the objects with which she has to deal — viz. :

Matter, motion and force; and it is in the correlation and theoretical adjustment of these that modern science has made its chief conquests and achieved the great results which mark our era.

This progress we must now attempt to trace. It is comprised in two important doctrines each of which may be expressed by a single comprehensive word. These words are *EVOLUTION* and *CORRELATION*; and the two ideas thus indicated must be elucidated at some length. Each of these words expresses the result of a long process of thought and investigation and sums up the history of a great conflict, which I am now to describe.

I shall speak first of the theory of *EVOLUTION*. The general doctrine taught under this name may be expressed in the following statement, viz.:

The objects of the physical world are not largely the results of sudden and instantaneous acts of creation, but of long processes of slow development. They have advanced from (1) small beginnings, (2) through continuous and usually minute changes, (3) extending through long periods, and (4) proceeding in accordance with the general laws of nature.

In the discussion of this subject it were well to remember, what is often overlooked by its zealous opponents, that although formulated by Mr. Darwin it is by no means confined to his speculations upon organic life. On the contrary, the idea originated long before his time, and must now be regarded as the embodiment and outcome of that great series of researches which constitutes really the science of our time. This will become abundantly evident by a brief reference to a history of the inductive sciences.

The scientific assertion of the doctrine of development began something like a century ago in the annunciation by La Place of the nebular hypothesis.

This doctrine has been taught under several modifications of form which amount almost to distinct theories; but disregarding these minor differences and assuming only the general reality of the progress which is described under the name of the nebular hypothesis, I observe that the history of this comprehensive force-action carries us back to the time when the whole of our existing planetary and solar system was a mere vapor, filling, in every part, the space through which its orbs now revolve. The sun was not yet a consolidated body, but only a central point from which, on every side, extended a vast mass of vapors or gases, altogether without defined shape or precise constitution. Slowly, with the lapse of that infinite time which the lights of Heaven had not yet been appointed to measure, a vast circle of revolution established itself, as gravitation drew each unformed particle closer to the center, and of course to the rest. The motion which we call heat, the phenomena that we name light, first revealed the existence of the monstrous and unformed mass to such intelligences, if such there were, as were privileged to witness

it. Chemical combination came next, the fact of which light is the expression, and in many instances the immediate antecedent. Mechanical aggregation followed, as one revolving ring after another was thrown off by the increasing velocity of the narrowing revolution. Finally, as new centers began to be established, orb after orb shaped itself to its perfect form, and each took its place in the series, and joined hands with the rest, in a system of revolving globes which stretches from the sun to the outermost planet of our system.

The characteristic fact of all this marvellous history is that the universe took shape and adjustment under the forming agency of the great forces of which I have spoken. Gravitation, in its familiar form, may be conceived as the initial force movement; heat, with its expansions and condensations, was perhaps the next great agency; chemical combination began to occur, as particle came within the sphere of particle. Each varied form of force took up its work, as the appropriate conditions came into play, until together they shaped the system and gave to our globe its peculiar character.

The end of all is the conviction that our globe is not eternal; that it has been fashioned, through an almost endless succession of ages, into its present form, from a condition of matter so elementary that it passes all imagination to conceive it aright. At first naught existed save those rudimentary particles which we now find combined in the various substances around us. Similar results have also taken place in the broader regions of the universe. Each star that glitters in our firmament has passed through the same forming process, and attests the working of the same mighty agencies through these blue depths above us and on every side.

Nor this alone. Beyond, stretch the numberless nebulae reporting themselves to the eye in dim specks which fade, as the distance increases, into utter indistinctness. Yet as our more powerful telescopes reveal them, they wreath themselves into masses which tell us the wondrous story of their formation. Here is one, circular in form, a complete ring of nebulous matter, save that at one point of the circumference a break has occurred where a part has been thrown out from the rest by the violence of the centrifugal force, and there it lies, projecting far in lines that radiate outward, not yet gathered up into its new form. There is another which after having gone through the same process, of first forming and then breaking a ring, has doubled back the two loose ends, and commenced the formation of what is yet to become two orbs revolving round each other — a binary star. So too we might trace the progress onward and still find in these immense and boundless systems additional indications of the progress of the magnificent work. Through age after age the slow revolution goes on, the mass gradually condenses, the appropriate combinations take place, and each mighty and complex system shapes itself to its ordained and final form.

The characteristic feature of this all-embracing theory of astronomical progress, is that it describes a most comprehensive system

of development. It alleges that the heavenly bodies have been formed slowly, and through long ages of imperceptible change, taking place through the agency of material forces, and by the regular operation of general laws. It thus brought all the cosmical arrangements of the heavens and the earth into relation with each other, as parts of one all-inclusive system of astronomical development. It was therefore the first great phase of the modern doctrine of evolution.

Next comes geology, with its more specific and unquestionable affirmation of the same general ideas. It teaches that a long course of similar developments has shaped our globe, and given it its present adaptation—an adaptation which it did not originally possess—to be the abode of man. Its primordial condition was that of a revolving mass of igneous matter, on which a crust of slag and scoræ was slowly formed by cooling, before the temperature was sufficiently reduced to allow the existence of water upon its fiery surface. At length, as the cooling proceeded, water became possible, and the gathering together of waters took place which we call seas.

Then began the prolonged work which has given us the vast body of the strata which form the geological series. Immense systems of rock, Archean, Silurian, Devonian and the rest—each of them thousands upon thousands of feet in thickness—were successively laid down in the ocean beds, by slow and regular deposit of sediments.

These strata, originally level, were tilted up into mountains, with their intervening depressions that formed valleys, or were piled upon each other in monstrous contortions, through the expansions and contractions of the mass; and still cooling and consolidating they slowly grew through the same silent and ceaseless changes into the form and order of the rocks which we have so largely traced and which we so familiarly know.

Next life appeared, and this too, at first, was in rudimental forms. The protophytes and protozoans in which paleontology assures us that animal and vegetable life began, were at first so low in organization that it is to-day a question which divides the students of primitive paleontology, whether the alleged types—like the eozoon and the paleotrochis—were ever endowed with life at all. We cannot draw any exact line and say “here life began.” A wide gap separates these humble beginnings from the higher forms which at length followed. But later, in place of the crude material and the elemental type, organic structures began to arise, till distinct and recognizable forms claim our notice. The trilobites and the brachiopods showed themselves in numerous species, whose endless varieties—now grown familiar to science—matured and perfected their organizations, and led on to the higher forms of our natural history scheme. Mail-clad fishes took possession of the deepening waters of the ocean, and reptiles crawled in the wide marshes of the coal measures. The mis-shapen pterodactyl sported in the murky air; gigantic saurians cleft the ancient seas with their paddles; huge mammals lift their heads from the ground, and tread with ponderous

feet the increasingly solid land. Higher and higher forms make their entry upon the scene, till at length man stands erect, the lord of creation, and raises his face of intelligence to the skies, uniting earth to heaven by a nature, rational and moral as well as animal, which partakes of both.

In all this process we have the same fundamental ideas disclosed to us. The beginning is in minute germs or in rude forms, so imperfectly organized that the structure is scarcely discernible. The progress is by insensible gradation, though not, indeed, universally. There are sometimes great and sudden quickenings of the movement in which the slow gradation bursts out, so to speak, into new forms and unlooked for developments, whose immediate predecessors do not appear in the series; but characteristically the development is regular and orderly, and the march proceeds by slow steps.

Lyell has laid down for us the law which governs it in his pregnant though memorable announcement of what has been called the uniformitarian theory in geology — that all the changes of this great physical progress had been produced by the slow operation of the same causes which we now see at work with ceaseless and steady, though moderate, energy in the world around us. This theory, at first, startled the world. It was almost incredible that processes so seemingly gentle and steady should have contorted the rocks and lifted the mountain summits, and worn away, by denudation, miles in thickness of the firm and solid strata of the globe; but to-day every geologist has adapted his conceptions to it, and no man questions the substantial truth of the assertion. It will, no doubt, need some modification. There seem to be some facts which refuse to come under the comprehensive generalization. There have been sudden and violent changes as well as slow and gentle ones; cataclysms as well as processes; storms as well as calms; but substantially, with whatever modifications, the dominant idea prevails. The earth has been wrought into its present adaptations to man's use, by a lengthened series of steady operations, developing it, and all things upon it, to their present dimensions and proportions, by the steady and uninterrupted operation of what we call natural causes.

In this striking account of the physical history of the earth, we see the second great phase of the development hypothesis, as presented by geology. A third, still more startling and revolutionary, remained.

All this did not touch the great world of organic life in our existing era, in which the theist had hitherto found the chief materials for his argument. The structures of the existing tribes of animals had evidently, he maintained, been formed by intelligence, and with a specific design to adjust each part to its function and its use.

But now, after many a crude suggestion of the same idea, Darwin came forward claiming that the organic beings which fill the earth had been produced, by the same silent and steady series of changes,

from pre-existing forms. The more specialised had arisen from the less, in an endless progress. Those of to-day are the progeny of ancestors of yesterday; and those of yesterday were but the modified descendants of those of an earlier day. Thus the existing species of animals and plants might be said to have been derived by laws of heredity, of variation, and ultimately of natural selection, through the varied and multiple forms of the intervening periods, from the early and humble types in which the palæontological series of the rocks had its lowly and almost imperceptible beginning.

The religious bearings of this far-reaching scheme of thought were at once perceived to be of a most important and even vital character, and the scheme itself was looked upon with great distrust.

In all this wonderful progress there seemed to be no need of a creative intelligence for the adaptation of the various parts and organs of animal bodies to each other. It was all accounted for, we were told, by the simple operation of physical causes. It was all accident, shaped to its seemingly happy issue, by a selective process going on in nature itself, through the mere friction and inter-action of its own laws. Generations of plants and animals vary somewhat from age to age. These differences accumulate with the years, till new types are formed, which develop first into new varieties and at length into distinct species. Those which happen to be — for there was no design in the purely physical and material causes which shaped the process and its results — those which happened to be better adapted than the rest to the circumstances in which they had to live; the hardier plant, the swifter or more cunning animal, lived; those of less fortunate organization, of less happy adaptation, died in the struggle for life, which came on with the cold of every severe winter and with the long drought of every arid summer. The feebleness, the clumsier, the less active in sensation, the less alert in movement, perished in the snow, the famine or the drought; their better furnished rivals lived, and they propagated a finer and more highly developed type of the species. The process went on till every defective form was eliminated, till every organ had been modified and shaped to its happiest adaptation, and till the remaining forms displayed a nicety of adjustment to their place and their function, which seemed to be the work of a designing mind.

The result of this most remarkable and comprehensive theory was an extraordinary revolution in the ideas of almost all thinking observers; but whatever its scientific interest, its moral aspect seemed ominous and repulsive. It appeared as though the Deity would be at length driven from all the spheres of scientific thought. No need henceforth of Him and His wise and adaptive foresight: the forces of nature would suffice for all. They could, by slow changes, adapt each species to its place, by the simplest physical necessity; by merely starving out and cutting off all that could not be so adapted. But here still new questions began to arise. If so much could be accomplished by the simple agency of the slow and gradual operation of physical laws, why not more? Nay, why not the very develop-

ment of life itself? which many indeed begun at length to say had in reality originated from brute matter alone: a suggestion however which finds no support in any of the grounds of observation on which the evolution theory is based.

We all remember with what strenuous resistance, and what serious censure this whole process was for a long time met, and resisted. Nor, when we come to estimate the theistic bearings of these theories, can a thoughtful mind be at all surprised at the hostile reception which the scheme encountered.

In the first place, though the doctrine of development did not directly assail, nor wholly abolish the idea of a divine creation of the world of nature, yet it seemed to reduce the creative agency to an absolute minimum of reality. It taught that the animal whose alertness and grace of movement were so remarkable, the organ, the adjustment of which struck us as so exact and admirable, had not been adapted by any creative agency to the function which it so perfectly performed. The eye, for example, had not been fitted for its office by any intelligent design; it had acquired its present degree of perfection through ages of slow change and necessary progress from a mere transparent jelly. Its apparent completeness had been attained by the simple process of killing off all the individuals of less exact adaptation, until it had come to be the sole survivor of a multitude of eyes, the others of which were less perfect. Nowhere, in all the long process by which an organ had reached its finished form, was there any great or recognizable change which could be credited to the power and wisdom of a divine Creator. The doctrine seemed to imply irresistibly that the world had had no all-wise designer. It had shaped itself to its present form by the necessary working of physical forces. It had deposited its strata, covered them with soil, and clothed itself with verdure and beauty by the mere continuous operation of the powers of nature, without a break in the chain of physical causation which could be attributed to a higher power.

Next, not only had the theory of development reduced the creative agency to a minimum, it had moreover removed even this to the remotest conceivable period of time. Only at the beginning — itself a point beyond all possibility of clear recognition — was there any scope for a creative work. All subsequent changes — which were generally of the minutest kind, and often wholly imperceptible — were referred to the blind agencies of material nature alone. Only in the originating of germs did there seem to be any need, or even any opportunity, for the intervention of a creative hand, or the contrivance of a designing mind.

Surely it was by no means surprising that many resisted the establishment of such a theory, and cried out for some more rational construction of the grand Universe, of which our own intelligence is the noblest part.

And yet the theory must be acknowledged to be a most comprehensive and philosophical one, and if it could be rescued from

profane aspects and uses, a most interesting and beautiful one. It is, moreover, the only such theory that the ingenuity of speculation ever has framed, or ever can frame. No other doctrine disputes with it the claim to be the only scientific and philosophical account of the formation of the universe. As such, we must say of it that it has a breadth of scope and a fullness of application which seem to be fast securing the recognition of the world. That which has conquered its way to the general acquiescence of astronomers, in the nebular hypothesis; and which has received the suffrages of all geologists in regard to the long periods, and the uniform progress of the earth's physical history, seems altogether likely to secure the world's acceptance of its truly philosophical account of the development of the organic beings of our globe.

Such then are the history and the results of one of the great scientific processes of our day; and such is the issue, in the comprehensive doctrine of evolution.

II. We must now, however, turn to notice a second and very different history, which will be found to modify these views, and to impose a construction of its own upon the theory, and the issue that I have described. I refer to the scientific development in recent years of the physical doctrine known as the conservation of energy, or the persistence of force.

All this time another process had been going on in the scientific mind with equal distinctness and equal force, in a very different, and apparently, a very unrelated sphere.

A new physical conception had taken the place of the old one. Men no longer spoke, when they had occasion to speak of the physical agencies of the universe, of fluids, as before. There was no longer a magnetic fluid, and a caloric fluid; there was no longer a question whether electric phenomena were due to one fluid, or to two; these were now recognized as *forces*, whose activities filled the world, and had shaped the forms, and originated the phenomena of matter. All motions were now referred to the forces of nature, and these forces next became the subjects of scientific investigation. Each separate force began to be sharply distinguished from every other, and to be regarded as the source of a great body of events and aspects more or less note-worthy.

These results, generally forms of molecular motion, were all regarded as manifestations of force; and the force impelling the motions that formed the subject of inquiry, constituted the central point of the science. Each particular science became, therefore, an account of the action and manifestation of a specific and distinct force, having its own laws, and expressing itself in a peculiar series of phenomena.

In the origin of scientific research, each of these forces had to be separately investigated; the absence of any observable links of connection between them required us to conceive them as entirely distinct. No one of them seemed to imply any close relation to any other. But the time came when certain relations between one and

another of them began to manifest themselves. It was early ascertained that the voltaic pile produced magnetic phenomena; and the result of this discovery was the identification of the two forces as manifestations, varying with the varying conditions under which it is exercised, of a single force. Soon the identity thus established extended itself so as to embrace the phenomena of electricity proper; and these previously independent sciences of magnetism, electricity and galvanism, or in its fuller form, voltaism, came to be regarded as essentially one, as did also the forces in which they appeared to originate. At this point the identifying process seemed, for a time, to be arrested; nor could the phenomena of the varying manifestations be further referred to a common cause.

Many years ago Whewell in his "History of the Inductive Sciences" recounted these earlier efforts, and remarked that the identification of the whole body of these forces would probably form the next great step in the progress of scientific philosophy. The result was by no means immediate, but the progress went on. Electricity revealed its power under peculiar conditions to effect chemical combinations and decompositions. The great step was thus taken of identifying voltaic electricity with the force that governs chemical combination, that is with chemical affinity.

More recently the advance of experimental research has disclosed a similar unity between forces that seemed yet more remote. Heat shows itself resolvable into a molecular motion in the particles of the heating, or the heated body; and indications began to appear of a close relation between heat and electricity, which were expressed by the term thermo-electricity.

At length Faraday, calling Whewell to his aid, took up the subject for a careful investigation and determination of the question; and Tyndall, in his life of Faraday, reports the character of his effort in the words which here follow. He seemed to ask himself: "Are there conclusive grounds for believing that the electricity of the machine, the pile, the gymnotus and torpedo, the magneto-electricity and thermo-electricity are merely different manifestations of one and the same agent? To answer this question satisfactorily he formally reviewed the knowledge of the day. He added to it new experiments of his own, and finally decided in favor of the identity of the electricities." His paper on this subject was read before the Royal Society in January, 1833.

The identity thus elaborately investigated and satisfactorily established, was so wide as to bring the electric force into very general relations with the other physical agencies of nature. So strong was this suggestion of the union of them all, that Faraday subsequently expressed himself in quite confident terms about it, as an ascertained fact. He traces the union of these powers, in these words, as quoted by Tyndall: "A few years ago magnetism was to us an occult power, affecting only a few bodies. Now it is found to influence all bodies, and to possess the most intimate relations with electricity, heat, chemical action, light, crystallization, and through it with the

forces concerned in cohesion; and we may, in the present state of things, well feel urged to continue our labors, encouraged by the hope of bringing it into a bond of union with gravity itself.

The subsequent progress of this intimate research has contributed to bring these various powers yet more distinctly into relation with each other. All these forms of molecular force, which express themselves primarily by varieties of molecular motion, are found to sustain definite relations to mechanical motion, and to be convertible into it. Friction arising from the mechanical motion of a mass generates heat, which is a motion of the particles of the mass. If continued, it produces smoke; that is, it disintegrates the mass, and liberates the particles from the cohesive attraction which held them; if still farther kept up, this molecular motion generates flame, that is, light. A bullet fired against a wall is stopped; its motion as a mass is arrested, and upon examination it is found to be heated. The mechanical motion has become a molecular one, but the motion is not lost. Heat, light, magnetism, electricity are all forms of molecular motion; and molecular motion is the resultant of mechanical motion. Each is convertible into the other.

Still more recently other and similar relations have been established between the remoter members of this great group of natural forces. The photophone of Bell affords an audible demonstration of the intimate relations which exist between light and sound. The impact of a beam of light upon a rubber disk communicates to it vibrations which report themselves not to the eye, as light, but to the ear, as sound; and even as I write, it is proposed to find the place of a bullet in the human body by the audible sounds of an instrument of this kind held over it.

Not only is one of these forms of motion convertible into another, but the conversion is an exact and definite one of a precise quantity of motion. The amount of motion, in any given manifestation of it, is measured and estimated with all the exactness of arithmetic. When such a conversion has been effected, the precise amount of the original is recovered in the converted form. The foot-pound affords a definite measure of the amount of any motor force; and, estimated in foot-pounds, the mechanical equivalent of any one of these forces is reproduced in every conversion of it into any other.

Such are the general conclusions of the physical philosophers who expound to us the natures and relations of these imponderable forces, and in these conclusions they have maintained a substantial agreement. The result is the general acceptance of the doctrine of the convertibility of the forces, and the belief that all forms of force in nature — of motor force, that is — are but related and inter-convertible forms of a general and wide-spread force into which they are one and all resolvable.

It is not for me either to affirm or to deny the accuracy of their determinations. If they seem to some a little doubtful, in view of the great complexity of a result into which so many minute and imperceptible forms of molecular action must enter, the presentation

of the doubt may safely be left to the more sober and deliberate judgment of the physicist himself. When the excitement of so great and beautiful a discovery is over, he will not be slow to discern the defect of the evidence; and perhaps by that time he may have it in his power to supply the deficiency. For the present, and for our own part, we may be content to accept the alleged convertibility of these forms of motion, and of these manifestations of force. The motions which form the subject-matter of the several physical sciences, however unlike in character, are only the varied expressions of a single comprehensive force, acting under different circumstances, and in different combinations.

The relations of this common and universal force have been traced by Mr. Herbert Spencer with great fullness and distinctness. The main point of his reasonings is, that the several forces of nature are not individual and separate agencies, belonging to the particular bodies in which, or through which they are disclosed to us; they are interchangeable manifestations of a general force, which pervades space in every part, and exerts its influence upon the innumerable bodies that compose the universe. Each specific force is but a transformation of some other, or a modification of that which is the common ground of them all.

This universal force is, at all points of the universe, absolutely the same. As it extends through all space, so it endures through all time. There never was a period when it began to be; and there never will be a time when it will come to an end. Like matter in the analysis of the chemist, force is indestructible. As the source of all other movement or force in nature, it is forever incapable of any measure, estimate or calculation; it is simply the original, inexhaustible and indestructible force of the universe. It is the sum of all that exists and acts, the one pervading, omnipresent, all-powerful, eternal — nay, that we are not permitted to say — but it is without beginning, end, or change in amount. In other words, it is the infinite!

Thus viewed the unitary force of nature is simply the all-pervading energy of what Mr. Spencer freely represents and designates as the "First Cause." It is the real author of all movement and change in the physical universe; the true source and ground of all the phenomena of nature. The lightning and the thunder, the summer breeze and the wintry storm, the rays that gladden us in the morning, and the glow that charms us in the evening sky, all are alike manifestations of the one universal and primordial Force.

It is carefully to be borne in mind that in thus conceiving of the forces of nature as phases of a single comprehensive energy, and of these endless differences of form as simply varying manifestations of this energy in action, I am not presenting any religious or theistic construction of the facts of nature, but the generalization of scientific philosophy itself. These are simply the results of that great conclusion which affirms the correlation of the forces, the unification of nature. In maintaining that all the agencies of light, heat, mag-

netism, electricity, etc., are interchangeable forms of each other, or of some single comprehensive power that embraces them all, science has substantially taught us that no one of these is itself a substantial force, but that each is a modified form of the fundamental reality. Voltaism, for example, has no individual and distinct existence as a force, that might enable it to account for any thing; it is but a transformation of electricity. Nor is the latter, any more than the former, a separate and distinct thing, but it is only a modified form of chemical affinity. "The voltaic wire," says Faraday in one of his happiest generalizations, "carries chemical affinity." Electricity, too, is naught but a converted form of the heat-energy. Each is as evanescent a phase of the general activity of the world as the other; and no one is any more substantive or permanent than is that into which it is convertible.

But if these so different exhibitions of force are thus intimately related to each other — nay, all thus identical with, and convertible into each other — we can well understand, and well believe, that the other forms of the motor agency of nature are equally so. All are but phases of the one great and persistent agency, which, as Mr. Spencer declares, is the infinite force. No manifestation, however distinguished in form from others, is any thing more than a varied aspect of that which is their common basis — the illimitable nature-force which has shaped the world. This is the comprehensive theory which under the concurrent agency of Messrs. Spencer and Huxley has shaped itself into the physical doctrine of the *persistence of energy*. It proclaims to us that no force is ever lost; and that if it varies its aspect, or disappears from view, it is only to reappear in some other form, which embodies and retains the exact amount of force that was present before the occurrence of the change. The original amount is identical and is persistent under whatever transformations.

A little reflection will enable us to perceive the relation of this theory to the teleological argument, as the complement and counteraction of the theory of evolution, already discussed. It subsumes all the facts and phenomena under a precisely opposite principle or law. The dogma of the persistence of force is the counterpart of the dogma of evolution. If that removes all scope and all conception of a Divine agency to the remotest era of the past, this imports it again into our familiar life, and makes it vital and real, where it had begun to seem shadowy and indistinct. If that reduces the creative agency to the most meagre dimensions, and assigns to it only the region of infinitesimal changes and mere minima of results, this enlarges it to a truly vast scope, and assigns to it a literally boundless extension. If the one regards it as an inappreciable and unnoticeable agency in the world's progress and development, the other esteems it an ever-present factor in every change — nay, the overwhelming reality which is the real factor of all the changes of nature. Instead, then, of being removed to a distance that would render him indistinct and small to our sight, the Creator is nearer and greater to us, in this later view, than he ever was before. Instead

of being separated from us by an extensive series of second causes and natural forces, inherent in all the bodies with which we are conversant and acting by methods of their own, He is Himself active and vital — nay, the only active and vital force — in things around us. The mighty energies of nature are but the manifestations of His infinite and ever-present power. He is more full and inexhaustible in the latter than in the former mode of conception. He becomes — perhaps the physicist would prefer to say *it* becomes — in the new view of the subject, the moving force of nature, the very embodiment of all its energies.

He is more systematic and orderly too; as he works, however actively, through the settled methods of established and uniform law, and by all the minute gradations which mark the progress of nature's sequences.

He is, moreover, more comprehensive; there is no change, gradual or sudden, no movement, swift or slow, which is not the result of his own activity — the expression of some varied form of his limitless energy.

The infinite is thus brought into the closest of all possible relations with the beings whom creative power has called into existence.

It is one of the most elementary and fundamental of all physical laws, that action and reaction are equal. Yes; but when you act, what, or who, is it that reacts against you? Is it simply a law or force of nature, cohesion, attraction, gravitation, or other? Nay, my friend, learn not by halves the great and significant lesson which the science that you have so long loved and gloried in, comes at length to teach you. The force that re-acts to or against the acting of your own force is, whatever its familiar name, or its common place aspect, nothing less, nothing else, than the *force of the infinite*! Such it must be, for, by the surest argument of scientific philosophy, there *is* no other. Has not science taught us, with all the beauty and all the power with which she is capable of teaching any thing, that each lower and more limited form of force is a manifestation, a phase, a form of that infinite and inexhaustible force "that fainteth not, neither is weary?" And, if so, how can we refuse, and especially how can the scientist logically refuse to recognize the fact that we stand thus face to face with an ever present, ever active, and infinite One "in whom literally we live and move and have our being?"

The scientific scheme of thought is here brought into the closest harmony with the religious conception of nature. Each regards the material universe as simply one great effect, or complex of effects, of the operations of an infinite force. The various powers or forces of nature, however distinct in their ordinary and regular manifestation, are, at bottom, scientifically conceived as phases or expressions of this great and pervading energy which fills all the space and controls all the matter of the universe. And this ever present, ever active, all powerful and undecaying force, without beginning and without end, possesses in these characteristics the fundamental elements of

the religious idea of one omnipresent, omnipotent, unchangeable, and eternal Creator and Ruler of the world.

This harmony of thought is the result of the general identification of the physical forces, now no longer regarded as separate and isolated powers inhering each in some one, or some few, of the natural objects of our globe, but scientifically viewed as inter-dependent and inter-convertible operations of the infinite and universal force, and so identifying themselves with the creative workings of him whom religion recognizes as the eternal Lord of the universe.

The scheme of thought which thus identifies the forces of the world with the activities of the First Cause, will at first strike many minds as standing in close relation with that pantheistic conception of the Deity into which philosophic thought has ever tended to run. The inquiry therefore will at once arise, "what security have we against this tendency to sink the distinguishing characteristics of the Deity in the mere qualities of matter?"

To this inquiry the answer is satisfactory and easy. But whether it is so or not is of small account. We have no option as to our view of the subject. Again the fact must be noted that this is not a religious construction, but a purely philosophic statement of the facts. It is not a theistic claim, but a scientific generalization, with which we are dealing. The forces of nature are one; and the movements of nature are the results and forms of its pervading activity. So science conceives it to be, a unitary force, moving and influencing all forms of matter, through the infinitely great and the infinitely small spaces which it fills alike with its ceaseless and inexhaustible activity. This infinite force of the first cause inevitably, we say, identifies itself with that which the religious mind has called God. Pantheistic or not, in its tendency, such is the comprehensive fact; and it is with this comprehensive fact that we have to deal.

Whether or not the theory shall be pantheistic, depends upon our mode of looking at and receiving it. That it has no necessary relation to pantheism will become evident at once when we compare it with the definition that Newton has left us to show his mode of conceiving things. "The laws of nature" he observes, "are the established methods of the Divine acting." This is perhaps the noblest embodiment of Christian and scientific thought in a single sentence ever uttered by a scientist; and it expresses the conceptions of the present hour in the language of two hundred years ago. We cannot doubt that the world's greatest scientific observer and reasoner found it quite practicable to conceive the idea of a universal activity of the first cause through general laws, without sacrificing, or even endangering, that other conception of a Divine Ruler and a present Saviour, which he so truly and devoutly loved and trusted in.

The only pantheism which we have to dread consists in accommodating our idea of God to our conception of matter, and identifying the two as indistinguishable. If we can recognize in the first cause a force capable only of mechanical aggregation and motion, and deny the possibility, or the reality, of any other or higher type of activity,

we shall undoubtedly be compelled to give up all conceptions of a moral order of the world and a divine governor of the soul. But there is no necessity of such an identification. We are entirely at liberty to take our ideal of divine agency from that higher form of action of which our own minds furnish the type. We may conceive of the First Cause as analogous to those second causes which are so familiarly known to us in our personal consciousness, and in our knowledge of our fellow-men. We are ourselves active beings, exercising force in the limited sphere of our own mental and physical organism, even as the First Cause exercises his infinite force in the realm of nature and through the kosmos. Such was evidently Newton's view—a conception in which the operations of nature, instead of being regarded as purely physical, were subordinated to the guiding intelligence and the free choice of an infinite and spiritual being. Such may be our conception—that of a force inhering, as all force must, in a substance pervading the universe, operating in all the movements of matter, impressing the marks of its own clear intelligence and its own high design upon all nature's myriad change, and ordaining the progress of them all, through whatever development, to some grand consummation. In such a view of the Creator, and of his relations to the universe, there need surely be no fear of pantheism.

An important check to this full harmony of views is found in that assumed position of the agnostic school of philosophy, which affirms that the human mind cannot attain to a knowledge of the infinite, and that all ideas of an infinite Creator and Ruler are hence impossible. This is the specific assertion of Mr. Herbert Spencer, adopted from the philosophy of Sir William Hamilton, who maintained that the infinite, not being a positive in thought, but purely negative—the non-finite—cannot be an object of philosophical knowledge. This idea, elaborated with all the great ingenuity and profundity of Hamilton, and illustrated with his almost boundless learning, made a strong impression on the thinkers of England generally, but upon Mr. Spencer, whose philosophy was then in a forming state, the impression was so strong that it swept him entirely away from the sounder foundation on which he had based his views when writing his earlier work on Social Statics.

The discussion which Spencer's irreligious application of this scheme called forth, opened the eyes of many who had been at first disposed to follow Hamilton into the adoption of it. Not only has it failed to obtain support from any large body of careful thinkers, but the inconsistency involved in it has been so clearly pointed out that the friends of Mr. Spencer are no longer willing to be held responsible for it.

The difficulty in sustaining Mr. Spencer's form of the agnostic doctrine, arises from the fact that he himself ventures largely upon predicates which declare very fully the essential nature of the infinite. He pronounces it "a reality," proclaims it "the fundamental verity," declares it to be "co-ordinate with all orders of phe-

nomena," recognizes it as the "First Cause," and "the infinite power," etc. Now when predicates embracing so many of the fundamental elements of human knowledge and thought are, with the utmost distinctness, freedom and confidence, applied to the comprehensive reality that we call the infinite, it is absurd to say that the infinite is unknowable.

If such distinct notions can be formed of it that we can call it a cause, a substance, a power, and can pronounce it active, vital, and productive of consequences, and if their reality can be so certainly known, and so confidently asserted, we surely must know something, and something, moreover, very important and significant, about the infinite. So open does Mr. Spencer's argument lie to this decisive objection, that his American followers feel that all attempts to defend his agnosticism is futile. Accordingly, it has been proclaimed in the *Popular Science Monthly* — the organ which has played so large a part in bringing his views before the American public — that the doctrine of the unknowableness of the infinite is not an essential part of Mr. Spencer's system. In this view we may perhaps be disposed to concur. The agnostic scheme, which cuts off the Creator from all possibility of being known by his creatures is, after all, no fundamental postulate, or profound principle of the philosophy which the system expounds; it is only an individual peculiarity of the founder, which having ceased to command the respect even of his most devoted adherents, can interpose no obstacle to the reception of more devout and consistent views.

Mr. Spencer's incautious and free designations of the infinite as the First Cause and the Infinite Power having exposed his argument to so conclusive a refutation, some of his followers have adopted a tone less frank and decided. They have sought safety in a greater reticence and indistinctness of speech. Mr. Tyndall, for instance, in speaking of the Infinite says: "I will not call him or it a cause or a power" — but mere blank silence is not philosophy. No one has more cordially accepted or more confidently taught the doctrine of the correlation of the forces, or done more to reduce the physical agencies of nature to a unity, than Mr. Tyndall himself; and his merely declining to pronounce the names which identify the powers of nature with the attributes of the great cause, serves but to show his sense of the weakness of the agnostic philosophy. If the forces of nature are fundamentally one, then every consequence which Mr. Spencer has so incautiously, indeed, but honestly and frankly recognized, inevitably follows: there is one great and universal force, of which those forces are manifestations and forms; and that universal force is none other than the creative power which has formed the earth and stretched out the heavens — the ever-present, the unchangeable, the unbeginning, the unending One whom Christ taught his people to adore as the "Lord of Heaven and Earth."

The expansion which we have thus given to Mr. Spencer's idea of the primitive Force, is indeed far from the religious conception of a Divine Author of nature. Mere power, in whatever grandeur

of extent, is not indeed God. But it is the foundation of the religious conception, which needs for its support a being of infinite attributes. A wisdom that is unsearchable, a knowledge all-embracing, a power of unlimited reach and irresistible might, a presence all-pervading, an eye to which the darkness and the light are both alike — these are what the theist has been wont to ascribe to God as his natural attributes. Beyond these, we need to know Him as a being of goodness, holiness, justice and love equally infinite, before the soul can recognize Him and worship Him as God.

The proof of these qualities must be sought, as we seek the proof of the goodness and justice and love of a fellow-man, in his works. Here it is that the teleological argument so long maintained, and so elaborately illustrated, by our theistic writers, asserts its force. We see proof of intelligence in the varied and numerous adjustments and collocations of organs in the animal world. The eye, the ear, the hand, the foot, each displays purpose and intelligence in its minute and elegant adjustments. Every bone and joint, each tendon and tissue, has adaptations and correlations, which interpret and commend it to us as a work of order, intelligence and design. Each lower field, each larger and higher sphere, is alike full of such manifestations, till the mind, overcome with the variety and multitude of the phenomena expressive of the creative goodness and wisdom, exclaims, as it looks up to heaven, "the whole earth is full of thy glory."

Into the reasonings which would defend and vindicate these views we cannot here enter. A volume would be required for their elucidation. All that can here be done is to indicate the direction and path of the argument, and to show by what steps we may pass from the grand but barren conception of the infinite force, to that of an intelligent author of nature; and still onward from this, to the idea of a moral order in the universe, and a moral governor of the soul, and of the world.

The further, and especially the complete elucidation of the subject, were an enterprise worthy of the highest powers in their best endeavor. In expressing the hope that on some future occasion I may return to it with wider scope of argument than an hour's lecture can furnish room for, I only give utterance to the hope and the prayer of a lifetime, devoted largely to this momentous theme, which here and now I can but commend to the diligent research and devout thought of my hearers.

Such then is the general result of scientific investigation and generalization in that fruitful period through which our age has been passing; and such is the bearing of its great generalizations of the doctrines of evolution on the one hand, and the persistence of force on the other, upon the great argument from design in nature.

If a scientific view of the world discloses as the general characteristic of nature the operation of physical forces through long ages of time, and in accordance with general laws, these physical forces

at the next step of scientific progress resolve themselves into manifestations of the one universal and infinite force. If the facts suggest powerfully the progress of geological and biological changes through minute and regular gradations, these gradations themselves have to be viewed as the uniform and systematic procedure of the one all-producing and original cause. Thus the omnipotent creator vindicates himself, in the very field in which his claim seemed to be most successfully disputed. The great Author claims his own work ; and science finds herself constrained, and we must hope, not unwillingly, to recognize the claim which her proudest and grandest generalizations make.

If she has not yet learned to bow in reverence before the great One whose footstep she has so distinctly traced, we must remember that she has learned her great lesson as yet but recently, and hence but imperfectly. Her eyes have been opened hitherto only in part, and she sees men as trees walking. Let us hope that here, as elsewhere in nature, the happy progress will complete itself ; and that when she looks again she will see all things plainly. Sooner or later, she will come to know in what manner of being this infinite force inheres, what are the laws and the methods of its working, and by what marvellous and pervading agency it is that part connects itself with part, and atom answers to atom through the boundless spaces of "the infinite azure." 'How is it,' says Sir John Herschel in his dialogue upon atoms, 'that atom responds to atom so promptly and so accurately across the spaces of the universe? There must be great presence of mind among them.

"Exactly so," says the other speaker ; "you have said it. *It is the presence of mind in nature that explains every thing.*"

NORMAL INSTRUCTION IN COLLEGES.

By Professor EDWARD NORTH, L. H. D., Hamilton College.

About three-fourths of the principals of academies in the State of New York are graduates from colleges. Fully one-half of the young men in each class that goes out from Hamilton college engage for a longer or shorter period in the work of teaching. A similar report would probably be made by other colleges. This work seems to be often undertaken on the theory that the acquisition of knowledge carries with it aptness to teach and skill in communicating knowledge. It is too easily taken for granted that a successful student will prove a successful teacher. Graduates who are to be lawyers, physicians or preachers are expected to spend two or three years in legal, medical or theological studies. But graduates who are to be teachers are allowed to hurry away from the position of pupils in college to that of authority as principals of academies and high schools, with no special preparation for the duties and best methods of the school-room. Probably they are less deserving of censure than their friends and advisers who fail to remind them that mere book-learning and competency in scholarship form but a small part of what is needed to qualify an instructor for the largest success. These beginners in teaching are deserving of sympathy rather than censure, if they are not reminded, at the outset, that in its intrinsic dignity and importance the teacher's calling is second only to that of the Christian minister; that absolute self-control, skill in communicating knowledge, patience in the details of daily drill, with the power of kindling enthusiasm in pupils, are essential to the teacher's fullest measure of success. Certainly every youthful teacher should be taught how to utilize the experience of those who have done good service and won distinction in his chosen profession.

Such aids are not denied to many teachers in our common schools who receive special drill in normal schools, academies and teachers' institutes. But college graduates who are to conduct the academies, and thus become teachers of teachers, are strangely left to magnify their office as best they may, and to work out their problems of duty as their own wits may suggest.

Is it not a wonder that so many are even moderately successful? Has not the time come for drawing attention to this singular deficiency in the literary colleges of the State? As all are in the same condition, so far as normal instruction goes, there can be no lack of fraternal courtesy in plain speaking. Now that all the northern and

western States have made provision, most of them ample provision, for the special training of common school teachers, it cannot surely be too early to say something in favor of providing, either by State appropriation or by private liberality, for the special and professional training of those who are to be principals of our academics and classical schools, and superintendents of public schools in our cities and rural districts.

By appropriating \$144,000 annually for the support of its normal schools, our State legislature has given the strongest indorsement to a plea in favor of making suitable provision for the special training of college undergraduates who propose to become teachers. Many of our common school teachers are taught in the academics and normal schools; the academics receiving aid and the normal schools their entire support from the State. It is a singular inconsistency that these academics and normal schools, which are expected to keep the State well supplied with common school teachers, should be left to find their own instructors wherever they can, or to train them for high positions as best they may. There is no college in the State of New York, and only two or three in the Union, having a chair of pedagogy for the special training of students who propose to be teachers. Yet a large percentage of graduates engage in teaching for a longer or shorter period.

It is poor economy for any State to leave students uncared for and unassisted who are to become teachers of teachers, and thus models for primary instructors to copy. A wiser course would be for the State to pay the college tuition, if not something more than this, of all students who will sign such a pledge as is signed by those who enter the normal schools, allowing them to study in any college in the State that will organize a normal department, and give special instruction in didactics.

At a cost of \$2,000 a year each of our literary colleges ought to support a chair of Pedagogy, and send out annually from twenty to thirty teachers, who would be thoroughly fitted for their chosen work, and zealous to express their gratitude for the State's assistance by instructing others in the best methods of conducting primary schools.

A normal department in college, supported by a liberal endowment from the State, and offering free tuition, would be an attractive feature. It would draw in young men who are now kept away from college by the lack of means, or the absence of that particular kind of instruction which they need. Time and experience would bring the normal department into entire harmony with other courses of study. It certainly should be a separate department, with normal exercises wholly distinct from those of any other department. Among these exercises would be a course of lectures on the history and philosophy of education, with essays and discussions on questions pertaining to the management of schools and the best methods of teaching. A very profitable exercise would be had by organizing the normal class into a model school, to be drilled by one of its senior members, subject to criticism from the normal professor. By

careful reviews in Virgil, Xenophon, Algebra, Geometry and other studies that belong to the academic curriculum, students in the normal class would be made familiar not only with the text-books to be used, but with the best manner of using them.

It may be objected that, although a large percentage of graduates engage in teaching, it is with most of them only a temporary employment, an easy method of paying off pressing debts and paving the way to some permanent profession. If this fact is fully admitted, it ought not to be called an objection to normal discipline in our literary colleges. It is really a very strong argument in favor of such discipline. As a matter of fact, only a small portion of those who graduate from our normal schools adhere to teaching for a lifetime. A college graduate who is to teach but two or three years can ill afford to waste the first year in clumsy tentative efforts to find out the best way of doing his work. He has no time for a teacher's apprenticeship. If he is to master the situation he must meet its difficulties with masterly skill at the outset. As soon as he crosses the threshold of the school-room, these difficulties confront him, not singly, but in solid phalanx. They are most numerous at the outset, and they refuse to be postponed. He must meet them at once, and he can meet them without fear, if forewarned and forearmed by the teachings of a normal professor.

Not among the smallest of the benefits to be conferred by normal instruction in our literary colleges would be its recognition of the intrinsic dignity and importance of the teacher's profession. Young men in college would be brought to realize that teaching has its acknowledged rank among the arts and sciences, and that the teacher's work should be undertaken from a higher motive than that of mending a temporary shortness of funds. Under the influence of normal instruction in our colleges, it might be expected that the bonds of sympathy and brotherhood which unite the college with the academy and common school would be greatly strengthened, and that new life would be breathed into our noble system of popular education.

LATIN ETYMOLOGY.

By Professor FRANK SMALLEY, A. M., Syracuse University.

The comparison of the curricula of our colleges with the curricula of the same institutions a few years ago, will reveal changes that are significant. Such institutions are conservative; they change slowly. Claims for representation in the curriculum must, therefore, be based on something more stable than the mere enthusiasm of specialists before they can be recognized. And this is reasonable, for the aim in laying out a course of study in college is to insert such subjects and make such requirements as shall secure the most symmetrical development with the best discipline.

But scholars are constantly investigating in all directions, and are producing results that must more or less modify the course of study. The various departments of physical science are demanding more attention in the four years' course, and the justice of their claim finds practical recognition. Mathematics and the classics find their domains encroached upon. Meantime the study of language feels the impulse of scientific method. More attention is given to comparative grammar, to the science of language.

Now, the basis of philology is the study of etymology. The investigation, therefore, of Sanscrit, Greek and Latin etymology is imperative. Never before has so much labor been bestowed on etymological dictionaries of all kinds as now, a natural consequence of a quickening interest in philology. The effect of all this on collegiate classical instruction is to give much greater importance, in class-room exercise, to etymological inquiry. Properly conducted such inquiry becomes a fascinating exercise, and can hardly fail to stimulate the appreciative student to a further pursuit of the subject in its more general features, than is possible in the limited range of a college course.

And thus, reciprocally, philology modifies and stimulates and directs our examination of the texts of classic authors, giving special prominence to one branch of inquiry, and this invites and allures into the broader field of scientific philological research.

And in this fact the lover of classical study finds hope and consolation. It gives new significance and greater importance to his favorite study. The imperative demands of natural science are offset by the equally important and valid claims of the science of language, and the equilibrium is more nearly preserved, vindicating the judgment of our predecessors.

It is the object of this paper to offer some suggestions on a single branch of this philological inquiry, so far as it pertains to the practical exercise of the class-room, and is limited to the brief time that can there be allotted to it.

Every student of Latin must observe how little the Latin grammars go into the subject of derivative etymology. Under the caption "etymology" the space is almost exclusively devoted to inflection, that is, declension and conjugation, properly branches of the general subject. Feeling the impulse of the spirit of scientific inquiry, and not satisfied by the meager information afforded him on this subject by the ordinary grammars, the teacher of Latin who is ambitious to bring to himself and his students the greatest possible benefit and advantage from its study, will eagerly seek other sources of information. The demand for information of this kind may be seen in the published notices and criticisms of Latin grammars. And to-day more than ever before material of this character is being introduced into the grammars. You will look in vain for much of it in the masterly grammars of Madvig, of Zumpt, of Andrews and Stoddard. But Roby and Key are more modern in this respect, and Harkness, Allen and Greenough especially, and Gildersleeve have recognized, to some extent, this demand. Indeed, the skillful incorporation of the condensed results of the study of comparative grammar is the latest feature of improvement in the making of Latin grammars.

But, after all, it is hardly the province of a grammar which is designed to be a manual for constant use in preparation and in recitation, to become a treatise on philology. The subject of derivative etymology should be so far treated as to give the various elements used in the composition of words, and their force, but the detailed statements of the origin of the elements, their more complete analysis, the comparison with similar forms of cognate languages, all of which has an importance to the student, that is ever increasing and cannot be overlooked, requires a separate book. In Sanscrit and Greek etymology, owing to the fact that the changes in the elements are slighter (save euphonic changes), this subject can be appropriately discussed, to a greater extent, along with the treatment of inflection. And it is so treated, though not very fully; and an elementary text-book on Greek analysis would be a desirable supplement to the Greek grammar.

But a more thorough study of Latin etymology than is usually given in preparatory school and in college is very important for other reason than because the spirit of inquiry impels to it, and because the scientific method is the salvation of classical culture. Of course it is quite as important that the professor of Latin be as much on the alert to take advantage of every advance in his department as that the professor of chemistry or of geology be up respectively to the fore-front of his science. But I speak now of the immediate advantages of the careful study of Latin derivative etymology.

We are to understand by this study the attainment of some facility in the analysis and synthesis of Latin words, the ability to separate into its constituent elements the word as it appears on the page of the author, and the knowledge of the origin of these elements and of their significance and force. The attainment of such facility

greatly enlarges knowledge. For knowledge consists in cognizing the relations of things. But the student's knowledge of a foreign or dead language too often consists in simply knowing the words and their equivalents in his vernacular with an imperfect understanding of the idiom. A careful study of individual words makes each word the centre of radiating relations, and often increases its value to the learner ten-fold. Without this study a word has no significance except as it stands in a sentence with the narrowest possible relations to other words in the sentence. It is devoid of the true dignity of an individual. Knowledge like this is superficial. The palæontologist is not content with knowing that the fossil he has discovered is an animal — or a mollusk — or even a brachiopod. He is not content with knowing the genus, but approaches more closely and determines the species, and studies with the profoundest interest and unwearied diligence each individual characteristic and relation. So does the zoölogist and the botanist with the individuals respectively of his science. And, in some sense, as the scientist arrives inductively at generalizations by the study of individuals, so does the student of language by the study of individual words enlarge the knowledge which the word affords; and instead of being a mere point, it becomes in significance, to his eye, a broad field wherein he discerns its history and its affinities.

Such facility must make an accurate scholar, for inaccuracy is always due to partial information. A habit of analysis may be formed which will act unconsciously and present an accurate picture of word signification to the mind. Moreover, it will not only render translating easier but will evidently increase greatly the pleasure of translating. Facility in anything affords pleasure in its exercise. In this case words lose that inflexible, arbitrary character that the student is always inclined to fix upon them; they unfold at sight, bringing the delightful feeling of accurate and ready knowledge.

The drill and discipline is not to be overlooked; and this derives its value chiefly from a habit of thoroughness necessarily inculcated, and particularly from an increased power of word discrimination, furnishing materials for the use of judgment, a fact of prime importance in the study of language. Altogether we may safely conclude that, while philology holds out many inducements to enter her fair fields, and these are irresistible to the lover of language, there are, independent of such allurements, advantages that are inestimable, and pleasures by the way-side, for him who modestly enters her portals, that abundantly repay all requisite effort.

But there are certain difficulties that stand in the way of a complete and entirely satisfactory study of Latin etymology when we bring it to the practical test of the recitation-room and to the page of the author. There are, first of all, many foreign words, mostly proper names, in Latin texts. Should the student attempt the analysis of these words? The answer may be, in general, *no*. Many of these words are Greek, and if the student have never read Greek, he could not be expected to know the elements of the words. There

are also many *Latin* words whose etymology is very doubtful. These await resolution at the hands of the philologist. He has not yet determined their precise origin and relation with any degree of certainty. They may be analyzed according to the light we have, following probable etymology and indicating the facts. But there are still other Latin words of whose etymology nothing is known. They are not subject to analysis. A list of them would be convenient for ready reference. Further, there are some things in respect to which philologists are not agreed, and there is a feeling of uncertainty regarding them. To the young student many of the conclusions of this science seem fanciful and doubtful, but a more extended knowledge of the laws of the interchange of letters and euphonic modification and of the forms of a given word in cognate languages and of analogy (there is much misleading from false analogy) will inspire confidence in the results and impart pleasure in the pursuit of this inquiry. Investigation in this field is not mere searching at random, but proceeds strictly on the principles of scientific method. As in natural science there are some conclusions on which we can rely implicitly, while others have only the value of hypotheses with more or less of probability in their favor, awaiting more light for their establishment or rejection, and every true lover of science stands unprejudiced, ready to welcome the truth whatever it may be, so in this study of etymology, there is much that is established beyond a doubt, while much has as yet but suppositional value, and the student of language has no less reason for encouragement to proceed, and no less stimulus to enthusiasm than has the scientist; and certainly his subject — the study of human speech — is no less important and is quite as interesting and absorbing as that of the student of nature. So true is it that what at first thought seems a check to advancement and a reason for discouragement becomes an incentive to investigation.

On the other hand, there is much that is favorable to the study of Latin etymology. A great many Latin words can be completely and satisfactorily analyzed, and this fact is of sufficient weight to warrant the student's mastering, so far as he may, the principles of analysis. Moreover, the Latin scholar who will examine any Latin text with a view to the analysis of the words, will be impressed with the fact that the most frequently occurring words, though in all possible forms, can be easily and perfectly analyzed. This, in conjunction with the advantages already pointed out, make it very desirable that our colleges especially should give more attention to this elementary etymological work, thereby introducing the student to the broader field of general philology. It is outside the beaten track, and will cost the teacher some effort, but he will add to his own resources and reap richer fruits in the increased pleasure of his work, and the consciousness of its greater value to the student.

Now, to be practical, the question must be asked: How shall Latin etymology be taught? and the answer should outline *method*. The answer to this involves another question, viz.: How far back

shall the analysis of the class room extend? Should the analysis of a Latin word go back to the Sanscrit and Greek forms of the root? For example, in analyzing the copulative verb shall the student write the root *as*, its Sanscrit form, or *es*, its Latin form? In the verb *ferre* shall *bhar* the Sanscrit, or *fer*, the Latin form be given as the root? Perhaps the best course with young students would be to use the Latin form, though in a text-book on this subject a table of roots in all cognate languages, when thus occurring, should be given, so that the student can have access to the various forms of the root.

It is manifest that limits must be placed somewhere in the inculcation of Latin etymology, since it is but a single branch of a general subject. It would, for example, be impracticable to attempt to familiarize a student at such a stage of the study with all the laws, often subtle, of comparative phonology. The complete mastery of these principles so far as elucidated would require years of labor. The study must be confined more to the anatomy of the word, leaving its pathology to be embodied in more general statements and displayed in tabular form. A few general rules of the letter interchanges and variations will be sufficient for elementary study, and these every student of language should master. The student must be supplied with all necessary equipments for the study. He must have at the outset the correct idea of a root it: must be accurately defined. Then the two classes of roots, predicative and demonstrative — roots proper and pronominal radicals — must be distinguished. Suffixes of all kinds must be defined and analyzed. He must be drilled in the analysis and synthesis of words, defining the force of each element. He will need to have accessible a list of primary suffixes, and a complete table of derivational or secondary suffixes, stating the character of the base to which they are attached, stating the force or signification of the suffix or its modifying effect; and even examples of its use will be helpful. Finally, he will need a table of Latin roots, and if this be a table of root-forms for the Latin and cognate languages, it will be the more instructive and useful. The student, of course, will know nothing of Sanscrit and may know nothing of Greek. This fact need be no hindrance to the study of Latin etymology, while the knowledge of a few forms from these languages for the purposes of comparison will do him no harm.

Another practical question is as to the time when this study should be entered upon. It should be considered an inseparable part of the study of the Latin language, and should, therefore, be taken up with the beginning of that study. A gradual inculcation of the principles of analysis and of the genetic structure of Latin words as living organisms would greatly increase the learner's interest in the language, render its acquirement easier, and beget a habit and method of study that the ordinary preparatory training fails to produce. This kind of training would raise up philologists for the future, and enlarge the field of American classical scholarship.

If we hesitate at the difficulties in the way, it may be well to

remember that Latin etymology is more easily pursued than that of our vernacular. The more modern a language, the more difficult, as a rule, is the analysis of its words. An ancient language is richer in inflectional suffixes which may be reduced to primitive forms and analyzed. The modern language is more circumlocutory and its constituents more changed by the influence of time and circumstance; and the labor of tracing the elements back to primary forms in the parent speech is increased.

It may be objected that the time that can be given to the study of Latin in the preparatory course and in college is so limited as to make it impracticable to introduce this additional feature. Perhaps so, if this study should require additional time. But it is believed that more ground can be gone over in the same time, and a better understanding of the language obtained, by introducing this study as a distinctive feature at the outset. And in college it may be pursued by the class in connection with the reading of an author, whose text will furnish materials for practical application.

The writer has tried this plan for two years, and has been gratified with the result. The student takes a deep interest in the work. It opens a new field and furnishes a new method to him. And experience has shown that classes read as much Latin and read it with more thoroughness than before. A text book is used teaching the general principles of analysis, and supplying the necessary information, in brief and compact form, but sufficiently full; models in analyzing are presented and blank tables bound in wherein to enter in neat and accurate form the whole process of analysis, the last space or column being designed for the direct English derivatives of the word undergoing analysis.

The design of this plan is to go farther than merely to separate the word into its component elements. It is to analyze the elements themselves, to apply to Latin etymology the latest teachings of comparative grammar so far as they affect the Latin, to take the student beneath the surface where he can trace the principles of word-building, and prepare him for the independent study of the science of language.

Is it too much to believe, in view of the more strictly scientific tendencies of modern methods of teaching, and of the strengthening claims of philology, that the Latin teacher of the future, appreciating the value of a knowledge of the foundation and philosophy of the great Latin tongue, will view it, not merely as the vehicle of the literature of ancient Rome, but as furnishing, in its independent development of forms, a splendid field for scientific etymological research, and teach it as a most suitable introduction to the critical study of comparative grammar?

ILLUSTRATION OF THE METHOD TAUGHT BY SMALLEY'S "LATIN ANALYSIS."

The §§ refer to sections in the "Analysis." R.=Root. Rd.=Radical. P.P.=Present Participle. N.=Noun. V.=Verb.

Root.	Class of Root.	Signification of Root.	Prefix.	Force of Prefix.	Suffix.		Force of Derivative Suffix.	Connecting vowel.	Character of Base.
					Pronominal.	Derivative.			
sta.....	(1)	stand	con	together=firm	(ja)= (ant) + (ja)= (t(a) r + s	ia ia ia	abstract	.. ....	P. P.
pa.....	(1)	feed, protect.	.....	.....	.....	.....	belonging to	.....	N.
m=ma.....	(2)	me	.....	.....	m (= u) a + (jaus)= t (us) +	s (ne a) (u)=nos ius tus	Comparative	.....	Rd.
rup.....	(1)	burst, spoil	in cor=con	not (=un Eng.) intensive	.....	.....	.....	.....	V.

Stem.	Root changed for stem. Rule.	Inflectional ending.	Force of Inflectional ending.	Word.	Nominative and Genitive Singular of word.	Change of Stem in word.	English Derivatives.
constantia	§ 2, 3, (7) (8) + prefix	(d)	separation (at=d)	constantia	-ia, -iae	ā = ā, d lost	constancy, etc.
patria	§ 2, 3, (8)	"	"	patria	" "	" " "	patriotism (Fr.) etc.
nos	§ 2, 3, (7) § 8, 18, b.	bis=bus	§ 6, 6, b, dat.	nobis	nos, nostrum	nos=no(s)	
incorruptior	§ 2, 3, (7) or (8) § 7, 2, b + prefixes	.....	.....	incorruptus	-tius, -tioris	or=us	

Root.	Class of Root.	Signif. of Root.	Prefix.	Force of Prefix.	Derivative Suffix.	Force of Derivative Suffix.	Conjugational Affix.	Voice Affix.	Modal and temporal Affix.	Connecting vowel.	Personal ending or case ending.	Character of Base.
scrib	(1)	write	de	down, off	.....	.....	(a)	.....	s	i	t	R
i	(1)	go	red	back	.....	.....	.....	.....	re	.....	t	R
gno	(1)	know	i=ln	not=(un-Eng.)	so (o)	inchoative (usually)	a	.....	a	.....	t	R
ag	(1)	drive	co=con	together, or intensive.	.....	.....	a=i	r	.....	.....	mu (s)	R

VERB STEM.	Stem of the Part.	Root changed for Stem. Rule.	Conjugation. Form.	Word.	Change of stem in Word.	English Derivatives.
describē	descrips	§ 2, 3, (7) + prefix	3d. sg. Pf. Id. Act.	descripait	§ 9, 8, (5) & a (d)	describe, etc.
redī	redī (re)	§ 2, 3, (2) + prefix	3d sg. Irreg.	redīret	§ 9, 14 (2), b.	
ignoscē	ignoscā	§ 2, 3, (6) (7) + prefix	3d sg. Imp. Sub. Act.	ignoscāt	§ 9, 14, (2), a.	
cogē	cogē	§ 2, 3, (7) + prefix	3d. sg. Ps. Sub. Act.	cogīmur	§ 9, 13, (3)	cogent.

MODERN AGNOSTICISM CONSIDERED IN REFERENCE TO ITS PHILOSOPHICAL BASIS.*

By Professor WILLIAM D. WILSON, D. D., LL. D., L. H. D., Cornell University.

A form of what is called *Agnosticism* is a conspicuous feature of the speculations of our age. It assumes that what we know by observation, or can infer from what we thus observe, is true and valuable; but that all else is either "unknowable" or valueless. It thus undermines all sense of moral obligations, and, in effect, justifies all neglect of religious duties.

St. John relates that after our Lord had risen from the dead and appeared unto several of His disciples, and the report of the fact of the Resurrection had spread abroad — Thomas, one of the Twelve, who was not present on the occasion of His appearing to the rest, refused to believe unless he could see the Risen Christ with his own eyes and handle His body with his own hands — although the testimony against his incredulity was at least ten to one.

After an octave of days, his curiosity was gratified, and his incredulity completely overcome by the personal observation of the fact he had so recently and so strenuously denied. On this occasion our Lord is reported to have said, "Thomas, because thou hast seen me thou hast believed. But blessed are they that have not seen and yet have believed."

From the nature of the case most of the blessings of Christianity must come, if they come at all, to those who have not had and cannot have St. Thomas' opportunity for personal observation of the Lord. They must believe without seeing Him if they are to believe at all.

Two writers, with names widely known and greatly revered, have contributed in ways not intended or foreseen by themselves, perhaps, to that form of agnosticism or unbelief which is quite prevalent in our age and quite as fatal to religious life and the spread of Christianity as atheism itself. I refer to Immanuel Kant and Sir William Hamilton — both of whom have gone to that world — where, whatever else there may be, there can be no "agnosticism."

PART I — IMMANUEL KANT.

It is now just one hundred years since IMMANUEL KANT published to the world his now world-famous *Kritik der reinen Vernunft*. And many of our countrymen are just now engaged in celebrating the centennial anniversary of its publication.

*It should be stated that only part of this paper was presented to the Convocation, and that too, in a form somewhat more diluted than as given here. W. D. W.

The work has never been popular with the masses, and it has been read and understood by but very few, probably, of even those who have professed to be its author's disciples. Its influence, however, has been wide-spread and deep-reaching in the domain of speculative thought.

Kant has incorporated into his work three points that are specially worth noticing in reference to the subject before us.

1. His theory of perception was such as to leave us in doubt whether there is really any external object that is perceived or not; and it made conspicuous the doctrine, that of the thing itself — *ding an sich* — we know nothing and can know absolutely nothing. All we can know in regard to it, is our thought about it. But Kant's *theory* — whatever he may have held and taught himself — leaves us in doubt whether this thought or idea had a subjective or an objective origin and cause — whether it arises spontaneously in the mind or is produced by something external acting on the mind.

2. Kant also made a concession with regard to the principle of "*Identity and Contradiction*," which was far-reaching and most fatal in its consequences; this principle lies at the basis of all absolute certainty; and constitutes the very foundation of all that can be properly called "*knowledge*" as distinguished from mere belief or opinion, held voluntarily and adopted from prudential considerations or acquiesced in as mere matter of sentiment and feeling — based upon the constitutional peculiarities of each individual.

The principles of Identity and Contradiction, of which I am now speaking, asserts that every proposition that contains an absolute truth can be reduced, by certain transformations of expression, analogous to the manipulations of an expert algebraist, to a form in which the subject and the predicate are the same, as *A* is *A*: or if the proposition is untrue it can, by a like process, be made to exhibit its intrinsic absurdity, by making the subject and predicate the same, but with the negative particle "not" between them; as *A* is not *A*.

Kant held and taught that this principle extends only to mere definitions — propositions which he called "analytic a priori." But as mere definitions they do not add to our knowledge of the subject; that knowledge we must have before we can define the object; thus, if I say a triangle is a three-sided figure, I define the figure indeed, but I do not know any thing more about it than before the definition. And hence, however the definition may increase the knowledge of those to whom it is given, it does not, cannot increase my knowledge or add to the stock already possessed by mankind.

This is doubtless a very abstruse and difficult point, but I think it can be shown, very satisfactorily, that the concession is entirely unnecessary, as it is certainly most inexpedient and damaging to the cause of sound knowledge.

In a general way we may assert that whatever truth or assertion, concerning any thing, can be made or based upon, or deduced from

the very nature or essence of the thing of which we speak, rests upon this principle of Identity and Contradiction. Thus it is doubtless true of all triangles that they have three sides each; it is of the nature and essence of triangles that they have the three sides, so that the figure that is not three-sided cannot be a triangle. But this is only a definition and therefore does not go beyond the limits allowed and assigned by Kant.

But suppose we assert of a plain triangle that the sum of its angles are equal to two right angles; this is not a definition in the sense intended by Kant. It is not a proposition, that is in his view, analytic a priori. And yet is it not as necessarily, as absolutely true as the definition itself? How can it be a triangle without this equality of its angles to two right angles any more than without three bounding straight lines for its sides? If not, then the one proposition is as absolutely true as the other; the one is as truly derived from and founded on the essential nature of the triangle as the other, and the one is therefore as truly based upon the principles of Identity and Contradiction as the other.

Let us carefully distinguish between the theoretical and the practical application of this principle. If what I have just said of the equality of the sum of the angles of a triangle be admitted to be true — and I am sure nobody will hesitate to admit it — then the *theoretical* application of the principle of Identity and Contradiction to all the truths of mathematics at least, is admitted; and the only question remaining relates to the practice of applying it. The difficulty of making the application is, in many cases at least, very great. But then it is only just the same as occurs in all algebraical operations, the unknown quantities *have* a value — whether in an algebraic or analytic, or differential equation — although it must be confessed that it is sometimes beyond the skill of the most expert mathematician to find it. I believe no one has yet succeeded in finding a satisfactory method of solving equations of the fifth degree. And, if I mistake not, there are several very desirable integrations which no one has yet been able to make.

Nor is this principle confined to mathematics. It extends to Logic and Ontology as well.

Take as illustrations two most important questions:

(1.) Do external objects really exist as the common sense of mankind always does and always has believed? Kant, as we have seen, left us in doubt on this point. But, let us see: the simple assertion is, "I perceive the object." But, suppose there is no object, or the object is nothing, then our proposition becomes "I perceive nothing." But if "I perceive nothing" I do not perceive at all. Hence, if there is no external object — or, in other words, if the idealism of such philosophers as Berkley, Fichte and Hegel be true — there is no act of perception; imagination there may be, but not perception.

(2.) Take another illustration — one upon a point on which, as I think, philosophers have more widely and more universally gone

astray than upon any other. We may state it in the form of a question, as follows: Do we perceive objects—that is, *substantial* objects—or only their properties? Do I see the table before me or only its color, form, etc.?

Most philosophers, as you well know, take the latter view. But suppose we test it. Is the color a thing, or only the property of a thing? The latter will be admitted. If, then, the color is a property and not a thing, when we say that we see the color, we say that we see what is not a thing at all, what is *no* thing or nothing. And, as we have seen above, to see nothing is not to see, and when we see nothing we do not *see* at all. Hence, what we see must be substantial things themselves, and they must be external realities—external to ourselves and as real as ourselves, the perceiving agents, are or can be.

Or, to be more specific and formal in our illustration. We have in the first case—namely, in the denial of the substantial reality of external objects as a result—a contradiction in terms. In the act of perceiving we do not perceive, or perception is not perception. In the latter case—in which we hold that the immediate object of perception is the properties of things and not the things themselves—we have properties are not properties, but substances rather, or things themselves.

The common sense of mankind truer in this, that the doctrine of philosophers has always believed in and acted upon this principle of identity and contradiction. They often say of a statement, “it stands to reasons,” or, “it is absurd,” “it involves a contradiction in terms,” and, in fact, the whole of what is known as the indirect method of proof or the excluded middle, depends on the acceptance and application of this fundamental principle of reasoning.

Thus it will be seen, that Kant gave away the whole question of knowledge and the possibility of knowledge when he conceded to agnosticism the doctrine that the principle of identity and contradiction extends only to definitions in the narrowest and most strict sense of the word, and that it can in no way and by no means be the basis of, or applied as the test to any proposition that could add to our knowledge of things—whether spiritual or material—whether temporal or eternal.

I think we have seen that his concession was not only unnecessary, but that it was a mistake—a very sad and fatal mistake. It gave away the whole basis and ground of absolute certainty in regard to every thing—quite unnecessarily and quite ruinously as I believe.

3. But the matter did not end here; this was not all, nor really the worst. Kant held that there are four pairs of *antinomies* which lie at the very foundation of all knowledge, and constitute the basis of every affirmation that can be made, whether in science or in religion, in mathematics or in morality.

These antinomies are only four in number and consist of pairs of contradictory statements each of which can be proved by most irrefragable demonstration. But they are in form, and, as Kant held, in their very nature contradictory of each other, and as we have no

means of discriminating between them, they must both be regarded as theoretically and, from a philosophical point of view, false, or at least as having no foundation in truth, and as constituting no part of science or knowledge.

Kant saw both the wide sweep and the profound depths to which his so-called "antinomies" extend. He says "there are four of them and only four, and they are natural and unavoidable; there can be, he says, neither more nor less because there are no more series of synthetic propositions which limit the empirical synthesis *a priori*:" "In them we have," in his words, "the whole dialectical play of the cosmological ideas, which do not allow that any object that is not in accordance with them shall be given in any possible experience; nor in fact can reason regard them as consonant with the general laws of experience."

He says "I have not sought in these mutually contradictory arguments, after deceptions, *blendwerke*, as advocates do, who avail themselves of the imprudence or unskilfulness of their adversaries, to take an advantage and willingly sanction and appeal to a misunderstood law in order to establish their own unjust pretensions at a refutation." He repeats several times the assertion that there can be but the four fundamental categories, and for the reason given, "because there are no more series of synthetic propositions that constitute the sum of our knowledge—no others that allow any object not in accordance with them to be given in any possible experience."

Kant had already said in this connection, "we have in fact no obligation to that which we cannot know;" thus his theory carries with it every truth of any practical value, whether in science or philosophy, in morality or in religion.

These antinomies are elaborately argued in the "*Kritik*," and re-stated with some further argument and illustrations in the "*Prolegomena*," published about two years afterwards.

The pairs of antinomies are as follows (I give them in the later form from the "*Prolegomena*"):

1. *Thesis*—*the world* has and had a beginning in time and is limited in space.

Antithesis—*the world* is, in regard to both time and space infinite (had no beginning, is eternal and infinite in space).

2. *Thesis*—Every thing in the world is *simple*.

Antithesis—There is nothing in the world that is *simple*, but every thing is composite (made up of parts).

3. *Thesis*—In *the world* there are free and spontaneously acting causes.

Antithesis—In *the world* there is no liberty, or free agency, but all is bound in the necessity of nature.

4. *Thesis*—In the series of the causes in the world there is somewhere a necessary Being.

Antithesis—There is nothing necessary in the world; but in that series of events that make up the world, all is contingent (accidental or casual).

I think it must be obvious to all persons that, if Kant is right, in supposing that there is a real antinomy or contradiction between the propositions that make up these four pairs, respectively, we are—as he claims that we are—delivered over hopelessly and helplessly to complete and unmitigated agnosticism. Towards the close of his discussion of the subject in the *Kritik*, he asks: “Where then are we? At what result have I arrived? Here every thing sinks under us. The most perfect Being, as well as the smallest and most insignificant, floats in mid air without support, before the speculative reason, to which it costs no regret to allow the One as well as the others to disappear without the slightest effort at resistance.”

Now, while many have dissented from Kant's conclusions, I am not aware that anybody has ever attempted to show precisely wherein consisted his fallacy, or the fault of his reasoning. Kant was recognized, at once, as being himself a master in logic; and so much of prestige did his name acquire that few, if any, persons would have had the hardihood to question the accuracy of any thing he might seriously propose, as the result of any careful analysis or vigorous demonstration.

I have spoken of Kant's treatment of the principle of identity and contradiction, and said that it was the foundation and ultimate tests of all absolute affirmation or certainty.

It is the foundation and basis of all demonstration as well, using the word “demonstration” in its strict logical and mathematical sense. Hence, in proving his antinomies, Kant resorts to, and uses the very principle he had so completely surrendered. And without that principle there is no possibility of proving either one of his eight propositions. In his argumentation under each one of them, he attempts to show—and as I think *does* show most conclusively and most unanswerably—that the proposition, *as he understands and uses it*, is true; and that its truth and certainty are based upon the very nature and essence of that which constitutes the subject-matter of the proposition.

It is the purpose of this paper—in part—to do what, so far as I know, has never yet been done in respect to these antinomies, namely, to show in fact that they are based upon and imply, in Kant's reasoning, in each of the cases, a fallacy in diction.

It would, of course, be very easy to conjecture or suggest *possible equivocations* or ambiguities in the use of terms, which, if admitted, might relieve us from the logical consequence of these apparent contradictions. But such a process would be unsatisfactory and could answer no good purpose; for the question would still occur to candid minds, whether Kant himself did really thus equivocate and palm off a fallacy upon mankind.

I propose, therefore, to look into the so-called “antinomies” themselves, or rather into the reasoning by which Kant sought to establish them, and find there, if I can, a solution of the difficulty.

And the solution is not difficult to find. It is in fact so simple and so obvious, when once found and pointed out, that one is more

than surprised that Kant did not see it himself, and is disposed to ask if this is all.

One thought in regard to this matter has occurred to me frequently, as I have been reading and rereading Kant's reasoning on the subject, namely, that much in Kant's discussion would suggest that he was not in earnest in setting forth these "antinomies," that he aimed rather to exhibit the absurdities that flow from Locke's system and his views of the origin and foundation of knowledge — one proposition in each pair exhibiting the logical conclusion from those premises, and the other setting forth a truth that could be demonstrated with equal force from other premises, leading, as such a process would inevitably do, to a conclusion that Locke's premises and theory must be wrong. His argument would in that case be of the nature of an indirect demonstration of the fact that in all knowledge there is and must be an element of insight, as well as of sensation.

But after a most careful consideration of the whole matter it seems impossible to acquiesce in this view. It has never been ascribed to Kant, that I am aware by his professed disciples and followers, nor suggested as a way of escape from his agnostic influence, by those who are the most opposed to it.

It should be noticed also that these views are in their results in entire accordance with the rest of the system which has made Kant's name famous.

Turning our attention now to the first pair of propositions, we have a *thesis* "the world had a beginning in time and is limited in space."

But, in his argument it is manifest that by the term "the world" he means the actual observed world, made up of objects extended *in space* and of events occurring *in time*.

He argues that these "events" constitute a series, occurring the one after another. Hence, there must have been one which was first in the series, the first in the order of time beginning *in time*, or, perhaps, *with* time, and *before* which there was no event.

So, too, with the objects *in space*; they are every one of them finite and limited. But no addition to, or multiplication of, finite objects can produce infinity.

This seems to me unanswerable.

¶ But when Kant comes to discuss the *Antithesis* "the world *is*, in regard to both time and space, infinite," he uses the term "*the world*" in quite a different sense. In the former case he meant the actual world of observed fact and phenomena, and he called it the "*weltreihe*" — the world series. But now he calls it the "*weltinbegriff*" — the world-idea or world-conception. And the whole line of his argument shows that he meant by the term "the world," as used in the Antithesis, not only what and all that actually is in the world, but all that its existence and reality *implies* as well.

This distinction is easily illustrated. A triangle actually consists

of three lines meeting in three points, that *is* the triangle; but the triangle *implies* that one of the lines is shorter than the two others — that the three angles are equal to two right angles, and so on — enumerating whatever truths and properties concerning triangles, we can demonstrate in our Geometry or Trigonometry. All these truths are included in the triangle — *inbegriff*, or idea.

So with the world; it actually consists of objects and events, which can never by any addition or multiplication make up infinity. And yet they imply, by necessary inference and inevitable logic, a something that was before all *events* and is more comprehensive than all *objects* — a something or Being that is not either an *event* in time or an *object* in space.

But surely here is no antinomy, no contradiction. Both propositions are harmonious, and, as it seems to me, both are proven to be true by most unanswerable arguments.

But, when Kant comes to deal with the second pair of propositions, attention is fixed upon the word "*einfach*," which I have translated "simple," or that on which the alleged antinomy or contradiction depends. In maintaining the "Antithesis" he uses the usual line of argumentation to prove the infinite divisibility of matter and of space. His proposition is, "there is nothing in the world that is simple — "*einfach*" — that is, nothing that is not made up of parts. There is no object or thing that may not be divided into parts, and there is never a part so small that it may not be conceived as still divisible into smaller parts.

In the "thesis," however he asserts that every thing or object in the world *is* simple or "*einfach*." But here he is dealing with *logical* division and not, as before, with *mechanical* or mathematical division.

Kant begins by referring to self, or the person, as an example and a proof. "I myself," he says, "am not divisible — the person is *einfach* or simple.

And what he says of self or the person is true of every object in nature or "in the world," to use his expression. Each one is an individual in a species. Every genus is divisible into smaller classes or species, and every species or smaller class is divisible into individuals. But here logical division must stop, not because the object is so small, but because it is one and not two or many — it is "*einfach*."

Hence every object in nature, though divisible *mechanically* into parts, is nevertheless, a unit, an individual object with a nature of its own; and *logically* indivisible or "*einfach*" because of its individuality, the question of size or dimensions does not arise at all.

And when so understood there is no antithesis, contradiction, or inconsistency between the two propositions. And they must be so understood or else Kant's argument in proof of one or the other of the propositions is a complete *ignoratio elenchi*.

In the third pair Kant raises the question of liberty and necessity.

In the earlier work, that of 1781, these propositions were stated somewhat differently and more at length. *Thesis*: Casualty according to the laws of nature is not the only one from which all the phenomena of the world can be derived. There is besides, a casualty through liberty, necessary to be admitted as a means of explaining them. *Antithesis*, there is no liberty, but everything in the world occurs only according to the laws of nature."

In proof of the Antithesis, Kant assumes the inertia of matter and goes on to prove that in "the world," that is the world of *inorganic matter*, everything acts in accordance with fixed laws and the necessities of *physical* causation. He is here in accord with science and the scientific men of the age.

But in his proof of the thesis he appeals to his own consciousness of *free* activity — of spontaneity. He finds there, as he says, "a dynamical first beginning of action, which has no dependence at all upon the casualty of any preceding one; that is, it does not in any way follow from (as caused by) it." This liberty is opposed to the law of cause and effect as seen in nature, and such a conjunction of causes and effects "as prevails everywhere in material nature."

But surely here is no "antithesis," no contradiction. "Necessity" and "the law of cause and effect" may rule in material nature, in *that* "world," while in the human soul and the "world" of spirit there may be a self, a mind, that acts freely or spontaneously.

Technically Kant's fallacy in this case is *non tale pro tali*. In one proposition he means "the world *exclusive* of human beings," and in the other he means "the world *including* man" with his rational soul and moral freedom. In the former there is no freedom, in the latter there is.

In the fourth pair of propositions the question of contradiction or agreement depends on the word "*zufällig*," which means, primarily, accidental or adventitious and secondarily, unimportant.

In the earlier work the word *zufällig* does not occur. The statement is, *Thesis*: There belongs to the world either as a part of it, or as its cause, some Being whose existence is of necessity. *Antithesis*: There exists nowhere either in the world or out of it as its cause, anything whose existence is necessary.

What is not *zufällig* in this sense is called "*nothwendig*," or necessary.

Starting with the doctrine that the objects "*in the world*" are effects, he argues that therefore they are not *uncaused* or *zufällig* in that sense.

But cause and effect are always related and may be regarded as two consecutive terms in a series. And then we have very much the same line of argumentation as in the discussion of the first pair of propositions, which brings us to the conclusion that there must be somewhere a First Cause — an uncaused cause; a cause which is not an effect.

But every effect considered as an effect is contingent or *zufällig* in the other sense of the word. It is not indeed, accidental, as

being uncaused, but it is contingent, as depending upon its cause and to that extent it is not absolute or necessary, *nothwendiges*.

And yet dependence implies something that is depended upon. Causation implies somewhere a cause that is never an effect and whose existence is no event.

In the world, that is the actual world of observed facts and events, therefore, all things are *zufällig* in one sense of the word and in another sense nothing is so. But in the world-idea the *weltinbegriff* there must be something whose existence cannot be derived — something which cannot even be *supposed* not to exist. Fix upon anything you please, and if it is uncaused and eternal it is not *zufällig*, but of necessary existence if it exists at all. If on the other hand it is an effect, it had a cause, and so on in a regression until we come to a first cause. And a first cause then must be, or must have been or there is no cause, no causation or no consecution or law of cause or effect in nature or anywhere else.

Now, taking the first, third and fourth pairs of propositions together we have the doctrine, that while the visible world is limited and finite, its objects acting in obedience to unvarying law and physical necessity, there is a being whose existence is of necessity and cannot be denied, who is first cause and who, from the necessities of the case, must be a spontaneously-acting cause — a personal Being.

In this last pair the chief ambiguity depends, as it did in the first and third, on the use of the words "the world." In the *material* world all is in one sense contingent, and in another all is necessary. But in "the world idea" there is contained, and so necessarily implied as in existence, something which is in no sense contingent and which is necessary in the sense that it cannot be non-existent.

I can well imagine that one, after reading what I have said, will pause and ask, is this all? Can it be possible that there is nothing more in these now world-famous "antinomies" that have kept the thought of Europe in a nightmare of suspense and suffocation for the last three-quarters of a century? I answer it is all — absolutely all. It is now more than thirty years since I first read the *Kritik*. I have read much of it many times since. And I have just read and reread this discussion of the "antinomies" to be sure that nothing important in it should escape me.

I have said that Kant was a great logician. He is recognized as an *authority* in that department. He wrote a treatise on the subject which the world has consented to regard as specially worthy of attention and honor.

But yet his treatise is purely theoretical. It omits wholly all discussion of the fallacies in diction. And yet the fallacy that runs through and underlies all these so-called antinomies is a fallacy of the very kind he has omitted to discuss. They come (I say "they" for there are several of them slightly different in character) they all come under the more general head of ambiguous Middle.

If I should remark "that light comes from the sun," I presume no one would care to dispute me or criticise the remark, the proposition seems obvious enough to pass without dissent or comment.

If then, soon afterward, I should say, in the course of conversation, that "feathers are light — very light," I presume that nobody would object. It would be considered as a statement that has come within the experience of nearly all persons, or if not it can be easily tested and verified.

But if now, any one, or if I myself, should attempt to put my two propositions together and say therefore "*feathers come from the sun*," the inference would be faultless and infallible *in form*. But the fallacy *in diction* would be just that which Kant, great as he was as a logician, has committed. It would not be a bit more real or more misleading in this case than in his, although it would be so obvious in the one as to mislead nobody; whereas in the other it has misled a large part of mankind for nearly one hundred years in regard to some of the most important concerns of life.

It is, indeed, true that Kant held that man has a moral nature, and that he is instinctively inclined to be religious. For this we give him full credit. But it does not save him from the charge of arraying man's intellect against his true instincts and his conscience, and thus greatly diminishing, if not altogether neutralizing, the force of nature and of conscience.

PART II — SIR WILLIAM HAMILTON.

In the October number of the *Edinburgh Review*, 1829, Hamilton first published his essay entitled a "*Refutation of the various doctrines of the unconditioned, especially of Cousin's doctrine of the infinite absolute.*"

In the essay referred to, Sir William divides all objects of thought, whether cognisable or not, into two classes, which he calls by several names; but those that most frequently occur and are the most important for our purpose, are "the infinite," "the absolute," and especially "*the unconditioned*," for one class; and the other he calls variously "the finite," "the relative," but most frequently "*the conditioned*."

Whether in the category of "the infinite" Hamilton intends to include more than the one being who is the proper object of all reverence and worship or not, may be a matter of doubt. It is a question, however, which I would not discuss or attempt to settle here. He makes, in regard to this being, the following two propositions (1) that we perceive, cognise or know, only "the conditioned," "the finite," and "the relative; and (2) that we cannot prove the existence of "the unconditioned," "the infinite," "the absolute," because in any "such syllogism we should collect in the conclusion what is not distributed in the premises."

These two propositions, it will be observed, dispose of the whole matter. The first pertains to all knowledge by immediate *observation*; and the second to all that may be claimed as the result of any process of *reasoning* based upon the data given in observation.

This philosophy will, therefore, limit and confine all that can be called knowledge to the objects of sense-perception — that is, to *material* objects and the present visible tangible world.

Cousin had expressly included in that class both time and space as ontological realities. But Hamilton, following Kant in this, does not regard them as ontological realities at all. And I shall go on as though Hamilton would include in this class only the one whom we call "infinite," "absolute," etc. It does not at all concern our present purpose, as I have already said, to inquire whether Hamilton would include any other object in this class or not.

It is hardly worth while to discuss here Cousin's theory of *a priori* ideas, implying the immediate cognition by an act of intuition of what Hamilton called "*the unconditioned*." It may be faulty enough; and doubtless it is open to severe criticism. But its faults do not prove Hamilton to be right. Both of them may be wrong.

Hamilton labors hard to prove, what I presume no one will care to deny, that whatever is thus perceived or cognised must be (1) finite, (2) relative, and (3) conditioned.

It must be "finite" in the most important sense that can be attached to that term; that is, it must be *limited* by, and in *contrast* with, something that it is not. The fundamental fact and condition of all acts of cognition is the duality of the perceiving agent and the perceived or cognised object. "I perceive this paper." If there is not both the eye that perceives and the paper that is perceived, no act of perception takes place or can take place. And so of all other acts of cognition, whether by sense, perception, or by intuition and insight. Hence the object perceived must be "finite" or limited by the existence of something of a different nature and individuality.

And the object must be "conditioned" and "relative" also; that is, it must be in such a "condition" and in such a "relation" that it can be seen. With but one object in existence or with any number *in no relation to one another*, if such a thing is conceivable, there could be no act of perception. Either there would be *nobody* to see or *nothing* to be seen.

In this, therefore, Hamilton is undoubtedly right. No answer can be given to his argument; and I can see no way of escape from his conclusion, if we keep to the precise point that his argument proves.

But we must be careful to note that this principle or law applies only to *direct cognition* and, as *Hamilton uses it*, to cognition by sense-perception alone; and, therefore, to *material* objects only.

But even here there is a fallacy which it seems to me it is well to pause and point out.

In regard to external objects, it is indeed true that they *are* "limited," "finite," "related" and "conditioned;" that is they *are* always and all of them in certain relations and conditions. But we never perceive them as finite, or conditioned.

The distinction is indeed a nice one; but it is vastly important. I see this paper *as white*. I feel it *as hard*. Hence I perceive it *as* hard and white, and not at all as finite or relative and conditioned. If it were finite but had no color I could not see it. If it were in

any "condition" or "relation" whatever, and yet not hard or cold, I could not feel it. Hence although all things *are* in fact finite and conditioned, I see them *as* luminous. I feel them *as* hard (or soft). I taste them *as* *sapid*. I smell them *as* *odorous*. I hear them *as* *sonorous*. But the words "finite," "relative," "conditioned," etc., do not come in among these adjectives. And we have no organ or faculty of perception or cognition after which we could place them, or either of them, as we place luminous after sight and sonorous after hearing.

But here is a manifest *non causa pro causa*. We see objects because they are *luminous* and not because they are "finite." We hear them because they are sonorous and not *because* they are "conditioned."

We may, then, concede to Hamilton *in terms* what he claims. We can neither *cognise* nor (perhaps) *prove* the existence of "the infinite" *as such*. But this does in no way prove or imply that we cannot know and prove the existence of *God*. We know Him as God. We prove His existence as Cause and Creator. Is He infinite? Is He absolute? Is He "the unconditioned?" Of course, philosophers must be allowed to call Him by these epithets if they choose to do so. And if their motive be one of reverence for the sacred name, we can appreciate it and sympathize with them in their feelings on the subject.

But this use of terms is bad — it is delusive.

All reasoning and all clear and scientific assertion depends upon the nature of the things we are speaking about — as denoted by their names. And adjectives are used to denote only accidental properties, or such as for the occasion we wish to make essential. Take the adjective "high" for an example. We speak of high tides and a high tariff, of a high wind and a high price, a high temper and a high tone. We have high seas and high roads, high aims and high excitements. Now it is most likely that there is no one property that is common to all these objects that we qualify by that high-sounding adjective; and certainly the adjective itself cannot have the same meaning when applied to them all. Hence, if we would speak of "*the high*," we should remember that, although there are a good many things that are "high" in one way or another, there is no such class or genus as the form of the expression implies, that can be dealt with for any scientific purpose whatever.

Much the same may be said of the expression "the infinite." We speak of an infinite space and of an infinite time, of an infinite number and of an infinite perplexity, of an infinite enjoyment and an infinite misery. But can we group all these and the many more objects that are sometimes said to be infinite into any one genus with so much as one single property that is common to them all? If not, we have no right to speak of "the infinite" in philosophic discussion. Nor can we do so without making assertions which it is neither easy to accept as true nor to disprove as false.

Now, without repeating what I have said in the former part of this paper, it appears by most irrefragable demonstration that events in a series one after another *in time* imply a Something whose existence is not an "event" nor yet a series of them *in time* -- a Being whose existence therefore must be eternal. The fact of consecution and the relation of cause and effect imply a First Cause. If there is no *first* cause, there can be no cause or causation anywhere.

Is He "absolute," "infinite" and "unconditioned?" He certainly is not "unconditioned" in the sense of being in no "relation" to us, or in no "condition" to be known, loved, obeyed, trusted in and depended upon. Is he "absolute?" In the sense of being under no restraint or obligation from or dependent upon external things, and of being in no danger of being resisted or thwarted, or — pardon the word — outwitted by anybody or any thing, He certainly is "absolute" — the Supreme Governor and Ruler over all things. Is He "infinite?" that depends upon the meaning you attach to the word. Certainly not in the sense in which Spinoza used the term; and from which *in that sense* he derived his pantheism. But though "infinite" and unlimited in ontological quantity — that is in respect of His reality, He is nevertheless limited in *logical* quantity: that is, merely to say, that He is never anything else but Himself.

Hamilton's metaphysical difficulties, however, went somewhat further than this. We find them exhibited and urged in the most pronounced and forcible manner by his disciple Mansel, in his lectures on "*the Limits of Religious Thought*."

He says (Lec. II) that "to conceive God as He is we must conceive Him as First Cause, as Absolute and Infinite."

To this I object, in the first place, that there is no necessity of "*conceiving*" Him in either of those ways — certainly not in the last two."

We "conceive" a triangle as having three sides and three angles and that is all that is necessary to our act of conceiving it; although much else may be *implied* in the conception of it — its "*inbegriff*" as the Germans call it.

But Mansel maintains that each of these three conceptions implies contradictions to each other and possibly intrinsic absurdity in themselves. "A cause as such," he says, "cannot be absolute." Why not? In what sense of the word absolute? If not, then God, *in that sense*, is not absolute? And I do not think He is any the worse for it. Certainly our faith and our theology are not.

Again, he says "God cannot be absolute, because the Absolute implies a possible existence out of all relations." Well, and most assuredly this was the case with God if he existed in the beginning and before He had created "all things visible and invisible." But with even so many as *two* things in existence, neither of them can be "absolute" in the sense here given to the word. Mansel objects to this view by saying that it implies "that God is not or was not infinite." There is certainly one sense of the word in which He is not

infinite. The word infinite is negative in form, and is also often negative in meaning. To say that God is infinite in *that sense* of the word is to say that He is not — does not exist at all.

Mansel concludes: "To sum up briefly my argument, the conception of the Absolute and Infinite appears encompassed with contradictions." But we ask what are you talking about? "the absolute and infinite" what? If you mean an "absolute and infinite" *space*, I agree with you. If you are thinking of an "absolute and infinite" *time*, I shall not object. If you mean an "absolute and infinite" number, I shall pause to consider what you mean by those adjectives. But if you are speaking and thinking of God, I say at once this has nothing to do with the question or the certainty of His *existence*, but only with the meaning you attach to the words "absolute and infinite" when you say they involve a contradiction or that He cannot be "absolute and infinite." If your assertion implies a meaning of those terms that renders them inapplicable to the subject you are speaking of, then, of course, they are inapplicable as predicates, and the admission is no disparagement to our natural theology. I say, for example, "there is a piece of white paper on the table." If you can show that it is not electric, or hot, or infinitely divisible, you assert nothing that is contradictory to, or inconsistent with my assertion of its existence or reality. So long as the question is as to its existence, your assertion is wholly irrelevant — and it raises a mere dispute about words — a mere worthless trifling — nothing but a quibble.

I think that Cousin is unquestionably right when he insists that all cognition, and all knowledge by means of cognition, rests on the principle of causation. He is thus, in fact, reasserting one of the doctrines of Leibnitz, that knowledge rests on the two principles, first, the principle of Sufficient Cause; and second, the principle of Identity and Contradiction.

Of the second I have said all I care to say just now. It will be seen that when starting, as for the most part it does, with an idea, a conception or a definition, it proves only laws and necessary truths concerning things, but not at all the existence of things themselves.

Hence the necessity for the other — the principle of Sufficient Cause, which is the first in the order of time and in some sense the first in order of importance.

It is certain that we know actual objects only as they, *acting as causes*, produce within us those sensations by means of which we perceive them.

It is equally certain that we know the soul or self within us, only as it acts as a cause or agent in producing those mental states or acts of which we are immediately conscious.

And then from these facts we reason by the principle of Identity and Contradiction to a First Cause — a Cause that is First, because uncaused, a Being whose existence no man can deny, knowing intelligently what he affirms, since such a denial involves a contradiction in terms — it asserts that what is, is not; that the uncaused is con-

tingent and caused, and that what is before all had also a beginning like all other things else, and may, not unlikely, like them also come to an end.

And to be thus *above* all, before all, and in all, He must be in all essential attributes unlike all material objects, and in His existence unlike that of all transient realities.

God must be the great first cause—the substantial reality that acts in and through all the phenomena of nature and all history; in the careers of nations and in the consciences of men, and He must be just what His acts and doings there and elsewhere prove Him to be; all that at least.

But in all this there is nowhere any need of the terms “infinite,” “absolute,” “conditioned” or “unconditional.” And I cannot but think that philosophers have allowed themselves unwarily and unwisely to be misled by the introduction of such terms, terms that are at best of doubtful meaning and of various applications.

Hamilton, like Kant, was a master in logic. Some there are who place him before Aristotle as putting that science on its true basis. He claimed, as we have seen, that any argument by which we might attempt to prove the existence of God, involves a fallacy in form or illicit of the minor.

It is quite true that Hamilton does not, in express terms, call the fallacy an “illicit process.” But the word he uses exactly describes an illicit process of the minor. They are: “We should collect in such a syllogism what is not distributed in the premises.”

Hamilton is, as I have said, a great master in logic, and therefore one hesitates long and considers well his ground before accusing him of either a mistake in such a matter, or of using words which appear to be precise and definite, with no clear conception of their meaning. And yet Hamilton has undoubtedly done one or the other of these things in this case.

Of course there can be no illicit process of the minor where the subject is a singular term, as the name of the Supreme Being always must be. Nor can there be any illicit of the major where the conclusion is a simple affirmation. Hence, there can be no illicit process, whether of the minor or of the major, in any syllogism that may be used to prove either existence or any one of the attributes of God.

But possibly Sir William meant to say that in our conclusion we should affirm something more than, or something different from, what we had included in our premises.

Now it is perfectly certain, as a matter of formal logic, that no word, whether noun or adjective, may be introduced into the predicate of an affirmative conclusion that had not been used in the premises as part of the major term.

But in the form of argument under consideration, this is not necessarily implied, nor is it usually done.

The terms *infinite*, *absolute*, *unconditioned*, are all negative in form, and when we predicate them of God, or of any other subject,

we do not add or "collect" any thing with regard to the subject. The use of negative predicates does not *affirm* any thing. If on says this thing is not white, or black, or hard, he gives us no knowledge concerning it. He really does not say any thing of it. It may be nothing that he is speaking of, and then all that he can say of it is that it is nothing. He may predicate of it all the negative terms that are in use in the language or that he can invent, and he will have said affirmatively nothing of the object whatever. It may be nothing after all, or it may be something of which we know positively nothing. Is not "space" such a term?

But again, by Excluded Middle, we can say of God, if we have proven that He is not finite, that "He is infinite," and that too, whether we know what the word infinite means or not. So, too, if we have proved that he is not dependent, we can say that He is "absolute," if that is what we mean by the term.

And in fact we are so much accustomed to the use of these terms that although they are negative in form and must be so regarded for all the purposes of the logical formulæ, we nevertheless regard them as in a most important sense positive, and attach to them a meaning that transcends all our powers of *imagination*, however, it may be with *conception*, a meaning which implies in fact a reality, the most real and the most substantial of all realities.

We reply then to all of Mansel's objections and criticisms — that it depends entirely upon the meaning he attaches to the words "First Cause," "Absolute," and "Infinite," whether we can predicate them as attributes of God or not. *But this is certain and perfectly clear, that in any sense of the words in which we can not predicate them of him, they are of no consequence whatever to our faith — to our theology — nor yet to our philosophy.*

Mansel, and all the school of philosophers to which he belongs, labor under two misapprehensions which I may briefly indicate. The first relates to our conception of "cause." Whatever we know *as an effect* or *know to be an effect* we know must have had a cause. But when we know anything *only as cause* it is to us, and for all our thought, a *first* cause, and may therefore be declared to be an *un-caused* cause, a *self-existent* cause, an *eternal* cause, until we come to know something more of it. Hence in this case there can be no question of an antecedent cause — or of causation before it; nor can there be any question of time in relation to it, except as it is itself a cause producing effects in time.

The second is in regard to time itself. And as the same difficulty occurs in regard to space, I will state the two together.

For me, sitting here and seeing whatever I can see at all from *one point of view* — the objects are distributed in space. One is before me, another behind. One on my right hand another on my left; and they are at different distances. But, suppose my eyes were omnipresent, so that I could see not from one point only, as now, but from all points of space at the same time — these space-relations of objects would disappear from my thoughts altogether,

or would have never occurred. There would be nothing to suggest them ; everything would be alike present to me.

So with time. *Now* and *for me*, thoughts come and go. I had one a moment ago. I have another now, and shall have still another a moment hence. I *am finite*. But suppose my mind were *infinite* — if that is the proper word to use in this connection — or if it were such, at any rate, that all possible thoughts and cognitions could be present to it at the same time, and at all times, I should have nothing to suggest to me time-relations. There would be in my thoughts no such elements or conditions of events as *before*, and *after*. In the first case I should have become omnipresent and in the latter omniscient ; and in both “infinite” in the only sense in which that adjective can be predicated to God. It may be difficult to understand, or rather to comprehend such a state of existence. But we must learn if we have not learned already, that there is much that is true, which, however, we can neither understand nor comprehend.

But some one asks, “what will you do with the relativity of all knowledge?”

I answer that if you refer to the expression, I would eschew it altogether, as in bad taste and savoring of very bad philosophy.

But if you mean by it to ask what I have to say of the assertion that “all knowledge is relative” I answer that I would analyze it and see what and how much of truth there may be in it. And perhaps we shall be a good deal the wiser and possibly a little more modest for the effort.

If it is intended to say that all knowledge is relative in that it is a knowledge of, or asserts the relations of things one to another, or of things to their attributes and properties the doctrine is true and vastly important. “Snow is white,” here we have a relation of a thing to one of its properties. “Man is an animal,” or, “John is in the house,” here you have a relation of things to other things. “Two and two are four ;” here we have a relation of two numbers one to another — or rather of things to one another in reference to number.

In this sense, and in this way, all knowledge — all that deserves the name or can properly be called knowledge, is relative.

But if you mean that all knowledge is relative *to us* — that it is only a relation between us and the things about which we claim to have a knowledge, the truth is quite different.

In this latter sense the proposition is only partly true.

In sense-perception it is true that almost all knowledge is relative. I see this paper as white, but this affirms only a relation between the paper and myself. A change in either the paper or myself might make it of another color. An increase of my strength might make what is now heavy, light ; and what is now hard, soft, even to the verge of the absence of impenetrability. And so of the other senses, any change in the organs of sense-perception as well as in the objects themselves, would change the result considered as an element of knowledge.

I said "almost" all knowledge by sense-perception. The limitation is well made. There is one exception, and that is form. Form is absolute, this paper on which I am writing is white and of a rectangular form. But a change in my eye might make it appear red, green or any other color. No change in my eye, however, or in any other organ could make it appear other than rectangular in shape, so long as I look at it directly. Its color is relative; its form, for the time being, is absolute. There is no "condition" or "contingency" about it.

But we have another part of knowledge that is not at all relative in this latter sense of the word.

"Two and two are four." This is relative if you mean that it affirms a relation—a numerical relation—between objects. But it is not relative to me, considered as the knowing agent—nor to any other knowing agent. It is absolute—that is, absolutely true. So, in fact, are all the truths of mathematics—all truth anywhere, and everywhere that rest not upon, or can be tested by, the Principle of Identity and Contradiction.

It is quite true that we cannot affirm the existence at any one time of any one object around us as an absolute certainty, for there is always the possibility of false perception. But *false* perception implies the reality of *true* perception, and true perception implies the reality of what is perceived.

In the same way consciousness of thought implies the reality of that which thinks—though it does not imply the impossibility of mistaking the character of our thoughts and misjudging ourselves.

Thus it appears that we know or cognize *immediately* that and only that which acts as cause either within our own consciousness or upon our organs of sense. Beyond this we know, whatever we know at all, *mediately* and by a process of reasoning. Hence the province of logic.

The objects around us are constantly acting as causes, one upon another. They attract and repel each other—they warm and illumine each other—under certain circumstances and conditions. The phenomena of electricity and magnetism belong to the same class.

Whatever these objects thus do to each other we call *effects*, and as effects, the phenomena thus produced had causes, and are to be regarded as of two kinds, and as coming under two heads. (1) As changes that begin and end while under our observation, and (2) those which are continuous. A body moves and then stops—we know it had a cause—a transient or intermittent cause of its motion. But the earth revolves all the time, the moon attracts the earth constantly. Nevertheless the earth and the moon have not always been as they now are. All things are in a state of change and the present condition with the present activities of these objects, one upon another, are the result of causes that acted upon them in some past time. And thus we are inevitably led back to an uncaused first cause. The very fact and law of a causation implies this. If there is no first cause there is no second or subsequent cause, no series of causes

and effects — no cause. But the first cause must, *ex vi termini*, be uncaused. And if uncaused, then it must be a spontaneously acting Cause, there was nothing to act upon it and produce what we call reflex action, which is the only other kind possible besides spontaneous action. But to act spontaneously in this sense, which is to act *voluntarily*, is no function or property of matter. It is the characteristic property of spirit and of personality; the First Cause then is a person and a spirit, a spiritual person.

It is one of the results of the progress of science in this age that all actions are reduced, in reference to their beginning, to three classes — *reaction*, *reflex* action and *voluntary* action. The first we meet in inorganic beings, when we are familiar with the law that action and reaction are equal. The next class we meet with in animate nature when we have nerve-centres responding to stimuli sent in, either from the tissues of the body or from external objects as they are perceived by the senses. And finally voluntary action, such as we are conscious of in ourselves.

Without going into nice or disputed questions it is manifest that of the three kinds only the last named — voluntary action, is possible to the first cause — or rather was possible, when and before the objects and events of time began to exist: there was nothing then to produce either *re-action* or reflex action.

But whatever is known as a cause is known as a *sufficient* cause. It must be sufficient to produce the effects we know it by; and this sufficiency of cause is the measure and extent of our knowledge.

The hard, red substance before me must be hard and red to produce the sensations in my eye and my hand by which I perceive the object, and it must be extended in order to be hard and red; and if extended then divisible also.

That of which I am conscious within me must be able to produce the phenomena of thought and volition, to perceive, and reason and choose, or I could have no consciousness of such activity within me.

The same law applies to the action of objects upon one other, by means of which we gain an additional or secondary knowledge concerning them. The sun warms the earth although it is a great way off; hence we say "the sun is very hot;" and all we know concerning it harmonizes with this statement. The moon raises the water of the sea into tides, and we say the moon attracts the earth, and we proceed to compute, from the observed phenomena, the force of the attraction.

Even when objects are as yet unseen and unknown, we often begin to acquire some knowledge of them by this indirect or secondary method. When the French astronomer observed the perturbations of the planet Herschel, he knew that there was one, as yet undiscovered, something acting upon Herschel. He knew it to be more over a planetary mass. He knew its direction, its distance and its size; and much else besides concerning it, though as yet it was unseen by human eyes.

So, too, the first cause must be adequate or sufficient for what we

ascribe to Him. First of all, as I have said, there must be *spontaneity* of action; that is action before there was anything to act upon Him, and produce, as in us, feelings and motives such as external objects excite — or reaction, such as we meet with everywhere in the material world.

But more than that, there must be power also — call it omnipotence if you please, or infinite power, if you prefer the expression. Nature with its varied objects and ever-changing phenomena implies such a power, a power that is all-powerful.

And intelligence, too. Is not everything in harmony and according with law? Do we find any thing that is unintelligible or difficult to comprehend except as the difficulty comes from the weakness or infirmity of our powers?

And is He not good, too? Does not pessimism always arise from the faults of those who indulge it? Do we not see that whatever else may be right or wrong, they themselves are wrong, out of harmony with any possible system of nature or of moral government?

Even Herbert Spencer, long ago, in his "*First Principles*" (§ 26) insists that there are and must of necessity be, within the domains of reality, two classes of objects — which he calls the *phenomena* and the *noumena* — the one material and seen by sense-perception, and the other only by the insight of reason.

But St. Paul was long beforehand with him in this. In his Epistle to the Romans he recognizes this fact with regard to God and his attributes, for he says "that which may be known of God," the noumena, "are manifested, made phenomena in the things that are made," that is the things that are made are phenomena or manifestations of Him, even His eternal power and Godhead. The noumena are manifest in the phenomena. This is precisely the distinction; there are the two classes of objects, the phenomena, a knowledge of which rests on sense, and the noumena, the knowledge of which is obtained by insight and reasoning. We have "the seen" and "the unseen," but the "seen" are phenomena and "the unseen" are noumena — seen by "the eye of the spirit," the insight of reason.

Here then, we have a foundation for Psychology, and for Natural Theology — *as sciences* — relating to objects that come within the range of cognition. By one or the other of the two methods they are within the domain of knowledge and of certainty; they are, or may be made to be, as rigorously scientific and as absolutely true as any of the "sciences" of which we in this age boast so much. Their objects are as real and their methods as legitimate as those of Chemistry or Botany.

Natural theology then has a *scientific* basis. It has a logical certainty. It has a sphere and a scope within which its truths are, or may be made, as manifest as any that we receive. Thus far all is within the domain of observation and logic, within the scope of science and of knowledge.

But this method carries us up to a limit, and shows us a domain

beyond observation and present comprehension. The beginning of life, the introduction of new species, the creation of man, are all, as yet, marvels and miracles too, to the mere man of science. Beyond what is comprehended there is something that is incomprehensible. Beyond all things finite there is somewhat that is infinite. Above the order of nature there is a supernatural order of things. We stand with our feet in the lower order; with our hearts and our minds we reach up into the higher. To the senses the lower are apparent — phenomenal; and to the reason the higher are not less certainly known, although they are only noumenal, matters of faith and insight or reasoning.

Along in this order came the incarnation, the miracles and the resurrection of our Lord. Here was the origin of a new species. Out of man comes the Christian. It is a new order, "a new creation," an "evolution," — if you choose so to call it — a further step in the development of the divine plan. It is a process by which we are "*born anew*" and are said to become "partakers of the Divine Nature," "created anew in Christ Jesus our Lord."

The fundamental fact, the existence of God, is an absolute certainty. The number and nature of his attributes are to some extent a matter of speculation and uncertainty. The facts of the incarnation, of miracles and of revelations belong to the domain of history. And both these facts and the doctrines taught, being to some extent above and beyond our comprehension, are and must ever remain matters of faith, and trust. We do and must to some extent walk by faith and not by sight, until we come to that world where faith is changed into sight and we can see and know even as we are seen and known. Of that state we know and can know but very little here beyond the mere fact of its certainty. We shall exist there in a state so unlike the present that most of what we call knowledge here "shall vanish away." That part of it only which consists in absolute truths can be expected to remain. All else, however pleasing or useful here, will be valuable there only as it ministers or has ministered to that "holiness without which no man shall see the Lord." Besides what we can know, we must add a belief — a faith — in what is above knowledge — a something to give hope and aspiration — courage and enthusiasm — a higher ideal and a sublimer pattern — something for which to aim and strive until we come to that higher and more glorious world where doubt and discouragement are alike unknown.

UNIVERSITY NECROLOGY.

MEMORIAL OF CHANCELLOR ERASTUS CORNELIUS
BENEDICT, LL. D.

By Honorable GEORGE F. BETTS, New York.

Since the last annual convocation of this University, Erastus C. Benedict, its revered Chancellor, and for the last quarter of a century one of its Regents, has passed from among us at the ripe age of eighty.

We cannot part from one who has been thus long and closely associated with this institution, and devoted to its interests, without placing our mourning tribute on his grave, without speaking that word of appreciation of his worth, and of his self-denying works in the cause of education and charity, that such a life as his demands.

We shall miss from these places that have known him so long and well, his genial face, his pleasant smile, his courteous manner, his persuasive words, his wise suggestions, his untiring energy.

His ear, indeed, cannot hear, nor can his heart respond to our words of loving appreciation; but we owe it to ourselves to show that we recognize and honor high and noble qualities, and to so use the legacy that he has left of his good name, as to draw others on to like lives of usefulness and self-consecration. And at the request of the Regents I present this brief memorial of their honored associate.

Mr. Benedict was born in Branford, Connecticut, on the 19th of March, 1800. His father was then a practicing lawyer, but about that time decided to enter the Presbyterian ministry, and preached his first sermon January 15, 1802, and then moving to this State, was settled consecutively in New Windsor, Orange county, in Franklin, Delaware county, and about 1815 in Chatham, Columbia county. He was a man of remarkable eloquence, drawing large crowds, and moving them by his addresses with wonderful power. His wife, the mother of Erastus, was eminent during her long life of ninety years, for her earnest and practical Christian spirit, the brightness and activity of her intellect and the vivacity of her disposition.

Mr. Erastus Benedict was the seventh in descent from the first settler of the family in America, who landed in Massachusetts Bay in 1638, and moved thence to Connecticut and Long Island, and, after filling many important posts in the several towns where he resided, died full of honors, as well as of years, at the age of seventy-three, his wife surviving him and living to the age of one hundred, and imparting to her grandson the incidents of their early life,

which were recorded by him in 1755, and have thus been preserved and transmitted.

Of the six ancestors of Mr. Benedict in the direct line, the first four were deacons in their respective churches, a position, in those primitive days of sparse settlements, of far more ecclesiastical importance than at present; and the last two, his grandfather and father, were ordained ministers, and all of them lived to good old age, the youngest dying at sixty-one.

It was with this inheritance of virtue and religion, this hereditary disposition toward the right and the good, as well as under the direct spiritual influence of his pious parents, that he began his life journey.

I know there is a popular sentiment that the children of religious parents are more apt than others to go astray and become atheists or profligates, and that this is especially so with the sons of clergymen. It is a fallacy, a gross and unfounded perversion of the truth. It is contrary to reason, to revelation, to fact. Those who recognize as the natural sequence of events that the children of Mahomedans should become Mahomedans, and of Buddhists, Buddhists, that the children of Romanist or Protestant parents should follow the religion of their fathers, yet ridicule the belief that the religion thus ingrained with the earliest thoughts, and moulded into the young formative life, can be a vitalizing power to control and regulate the being. Experience shows that it is: that the child with the example of true faith and an humble walk daily before him, is the most apt to adopt these as his patterns, and to strive to emulate them. The membership of our churches, our theological seminaries, our pulpits, derive their largest, most constant, and most reliable supply from this source of the religious household and the influence of the home family circle. And while there are doubtless striking exceptions which attract attention, and by their noticeable character have given currency to the fallacy; while there may be found an Aaron Burr descendant of Jonathan Edwards, yet it would be as absurd to attribute to the religion of the parent the atheism or profligacy of the child, as to argue that because John Newton came to the ministry from the deck of a slave ship, that slave ships would form the best school for furnishing ministers of the gospel. If there be any truth or power in the idea of heredity, let us claim, and have the benefit of it for Christianity also, and not allow all its power and its logic to be used exclusively against it.

The young lad grew up in his country home with these surroundings and under these influences, and at the early age of sixteen was already a teacher taking charge of a common district school, beginning, where wise beginnings only can be made, at the foundation, and acquiring thus the knowledge and experience of the wants of children and the duties of teachers, and of the scope of a system of education for the people, which qualified him for his subsequent useful labors and exalted position in connection with the cause of education. At eighteen he entered the Sophomore class of Williams

College, graduating in 1821. He became then principal of an academy at Jamestown, and subsequently of one at Newburgh; and then for a year was a tutor at Williams College, where he had under his instruction Mark Hopkins, since president of that institution, and whose fame as an educator of youth and an eloquent upholder of the truths of revealed religion, as well as a profound metaphysician, stands without a superior, almost without a peer, among the men of this generation. Since 1855 he has been one of the trustees of his Alma Mater.

He was chosen a school trustee in 1842, when the common school system of the State was extended to the city of New York, and served faithfully in that capacity until 1850, when he became a member of the Board of Education, and was its president for several years until 1863, when he resigned.

In 1855 he was appointed one of the Regents of this University of the State of New York, and in 1878 was made its Chancellor—the highest position within the State in connection with education—and that position he held at the time of his death.

He came to the quarter-deck, but it was by the way of the fore-castle, not through the cabin windows. He passed through each gradation from scholar and teacher in a country district school, to Chancellor of the Regents of this University. He was thoroughly qualified, not by mere theory, but by personal insight and practical observation, to organize well and wisely this beneficent system which brings within the reach of all, even the poorest and humblest, the blessings of education.

Who can rightly weigh or measure the importance of this system in a land of republican institutions! To any people knowledge is happiness and wealth and power. It exalts the intellect; it brings man into association with books, and thus gives him friends that never fail nor weary; it supplies to him the choicest thoughts of the wisest of all generations; it teaches him all that men everywhere can teach; it trains his powers of thought and expression to give him command over his fellows. These blessings it brings to all. But when each citizen is a sovereign, and by his vote has equal weight with the best and most learned in determining our course and policy, then it is patriotism to make each vote wise and intelligent, and the man who does most to achieve that end deserves well of his country. There is no man in our whole land, throughout its length and breadth, who during the past forty years has done more for that great patriotic end than Mr. Benedict.

He had the State of New York and the city of New York for his field of labor—the Empire State and the Metropolitan city. He saw the system of common schools extended to that city and became one of the first trustees upon whom devolved the inauguration and establishment of the system there. And as we see the great and successful results that have been attained, that the schools under the charge of the Board of Education now number 306, where nearly 300,000 pupils are annually taught, requiring the services of 3,000 teachers,

and involving the annual expenditure of \$3,800,000, and observe that, from among his companions in that early work, he has been selected to rise through all successive gradations of office to the highest, we realize how much of that result can with just discrimination be attributed to his talents and his efforts.

In 1827 Mr. Frederick J. Betts became clerk of the United States District Court for the Southern District of New York, and Mr. Benedict, who had been his classmate in college, and had been admitted to the bar in 1824, took the position of deputy clerk, which he retained for about two years.

This circumstance directed his attention to the Admiralty law and practice, and in that department he achieved a marked success and a well merited eminence.

During nearly five hundred years there was a fierce conflict between the advocates of the Common Law and of the Admiralty in the effort to restrict the jurisdiction of the latter.

Probably no contest in reference to any judicial question was ever more earnestly and ably conducted both in England and America. It has resulted in the establishment of Admiralty jurisdiction in both countries on a broad, firm basis. In this contest, during the last half century, Mr. Benedict has borne a most prominent part. He recognized the Admiralty, with its foundation laid in the wise liberal maxims of the civil law, as embodying the summary of human wisdom, and as best calculated to regulate the contracts and to redress the wrongs incident to the business of a commercial and maritime nation. He labored with affectionate zeal to enlarge the powers and confirm the authority of Admiralty Courts. And he saw, what it is granted to so few to see, his labors crowned with success and the end achieved.

All professional men need some side occupation as a relief from the mental tension of their regular daily employment. Few choose in that respect so wisely as Mr. Benedict. He found in literature, and in promoting the cause of education, that restful amusement of the mind that enabled him to bear the severe strain of his legal labors. He wrote with great facility, and writing was a pleasure. He enjoyed the exercise of this creative faculty without regard to whether the product was to see the light or not. He wrote voluminously, although he published comparatively few of his productions.

To his profession he gave a valuable treatise on American Admiralty.

He described his trip through Europe in an easy narrative style, that interested all readers and required six editions of his book to meet the popular demand. With ripe scholarship and deep christian feeling he selected and translated the choicest hymns of the middle ages, bringing within the reach of all, those noble expressions of devotion and piety. How well these three leading efforts of his pen illustrate the many-sided, benevolent character of the man; recognizing his obligation to his profession, seeking to convey instructive pleasure to the masses, and opening to all a rich mine of

religious feeling and instruction. He also bestowed considerable labor on a genealogy of the Benedict family, to which he wrote a preface. In 1840 he delivered the annual address before the Alumni of Williams college. In 1879 he read in London a paper on the difference in the rule as to limit of liability in collisions at sea, between England and all other countries. His discourse, delivered before the New York Historical Society on its fifty-ninth anniversary, in 1863, was a learned and powerful vindication of our pilgrim ancestors from unwarranted attacks made upon them; and sustained their just claims, against the unfounded pretensions on behalf of Sir Ferdinand Gorges and of George Popham, to the glory of American colonization. Many of those now present heard and still remember his address delivered at the University Convocation at Albany, July 9, 1878. It is the crowning literary work of his life. It should be in the hands and library of every citizen in this country. It gives the garnered fruit of his life-long experience in connection with education, expressed in aptly chosen words and happy illustrations, and advises, with a wisdom we should all reverently heed, what we should do in the future to advance the interests of this sacred cause.

In a life so occupied with the labors of extensive professional engagements, and the claims of the cause of education, he might well have demanded exemption from those other calls of religion and charity and citizenship which require time and thought and care. Time, however, fails me to do more than enumerate the list of those associations in which Mr. Benedict was not merely an associate, but an active working member, for he was so organized that where he was he must work. He was a member of the International Association for codifying the law of nations. He was one of the members of the association for improving the condition of the poor, from its organization in 1848; one of the governors of the Woman's Hospital ever since its incorporation; one of the trustees of the West Side Savings Bank, and a manager of the American Art Union during its existence. He was for forty years a member of the New York Historical Society, during part of that period its second and then its first vice-president, and at the close of his life its foreign corresponding secretary.

He was a member of the common council of New York in 1840. In 1848, and again in 1864, he was elected to the Assembly of the State of New York, and in 1872 to its Senate. And he was also for many years an elder in the Dutch Reformed Church, and faithful and zealous in discharging the duties incident to that position.

Lord Bacon wisely says "that there is nothing more awakens our resolve and readiness to die, than the quieted conscience, strengthened with opinion that we shall be well spoken of upon earth by those that are just and of the family of virtue."

This source of strength, in the good opinion of his fellow-men, was given to our departed friend in no stinted measure. Unsought honors pressed upon him throughout his life. And now this uni-

versal voice of regret and of sadness at his loss, these good words that are "spoken of him by those that are just and of the family of virtue," which come to us from every quarter, attest that, with modest self-consciousness, he could rightly summon this opinion to his aid when he looked upon the slow, but inevitable approach of that hour which must be his last.

But he had, beyond and above that, the quieted conscience, the well-grounded faith, the knowledge that his Redeemer liveth, wherewith to "awaken his resolve and readiness to die," and he looked forward to that great change with unfaltering gaze; and, when his summons came, he passed with intellect unimpaired, with will unshaken, with natural vigor unabated, from life to death.

And now, as we close these words of remembrance of one whose presence among us has conferred so much of happiness and benefit upon us and upon all those among whom he dwelt, I find no parting words more fit than those which he himself has rendered from a noble Latin hymn:

This body take to cherish, Earth —
As to thy gentle bosom's dust
These limbs, to which thou gavest birth,
These noble relics, we entrust.

For here once dwelt a living soul
Created by the breath divine,
And wisdom, Jesus did control,
These mortal relics did enshrine.

Protect thou Earth the body then
Within the grave in silence laid —
For God will call to Him again
What was in His own image made.

JOSEPH RAYMOND DIXON.

By Principal E. J. PECK, of Homer Academy.

Joseph of Raymond Dixon, son of the Rev. David R. Dixon, was born at Utica, January 30, 1811, graduated at Hamilton College, 1837.

Principal of Cherry Valley Academy, 1837-1840; married Miss Eliza Gould, June 2, 1840; first principal of Cortlandville Academy, 1843-1847; principal of Manlius Academy, 1847-1850; principal of Champlain Academy, 1850-1853; teacher of mathematics at Cortland Academy, 1853-1856; editor and publisher of the Cortland County Republican, 1856-1876; died October 29, 1880.

As a student and scholar Mr. Dixon took the highest rank in his class and was known throughout his life for his thorough scholarly attainments.

As a teacher he was eminently successful from his thorough work in the class-room as well as the quiet energy and enthusiasm he manifested in the subject, and he became widely known by his success in moulding and directing the minds of many who have since become men of mark and usefulness in their day.

His work as the editor of a political journal was marked by the same honesty, purity and devotion to truth which characterized him in every department of life, public and private. He made the claims of party politics at all times subordinate to the moral interests of the community in which he lived.

While he was thus active and prominent in various stations, it was his character as a man in these relations that is most worthy of record. Orthodox and conservative without bigotry, in sympathy with all real reform yet without radical bitterness, in all the acts of his life he shone as the model Christian gentleman. He was essentially great and good, or rather great in goodness, and when the sad accident by which he met his death became known, he was mourned by a whole community as though each family had lost a personal friend.

PRINCIPAL GEORGE H. TAYLOR, A. M.

By C. W. BARDEEN.

June 19, 1881, at Amsterdam, of heart disease, George H. Taylor, principal of the Academy.

Principal Taylor was a son of the celebrated Rev. Samuel H. Taylor, principal of Phillips Academy, Andover, and was at the time of his death forty-one years of age, dying upon his birthday. He was for nine years professor of classics in Phillips Academy, and assisted in fitting many students for college, and also aided his father in compiling his Greek grammar. He was for four years principal of the Academy at Kinderhook before removing to Amsterdam, where he took charge of the Academy last fall. He leaves a wife, the daughter of Hon. E. P. Emerson, of Nashua, New Hampshire, and three children — Charles, aged twelve; Harvey, aged ten; and Carrie, one year old — to mourn the loss of a kind and devoted husband and father. Coming of so noble and learned a family, Prof. Taylor inherited a profound love for study and a deep and well-balanced mind. As a classical scholar he had few equals. Brought up under the instruction of his noted father, who was as fine and thorough a Greek and Latin scholar as America ever produced, and himself a graduate of Dartmouth College, Prof. Taylor had made the study of the classics a specialty, and acquired a wonderful proficiency in them. This was seen in the ease with which he could compose in Greek and Latin, he having recently written a play and a song in Greek, and a colloquy in Latin for the closing exercises of the present term of the Academy. We have a letter from him dated May 14th, reading as follows:

AMSTERDAM, N. Y., *May 14, 1881.*

Mr. C. W. Bardeen:

DEAR SIR — What do you say to publishing a series of books on classics? A series of questions on preparatory works such as Cicero, Virgil, Xenophon and Homer? perhaps more elementary works also? I have had it in contemplation for a long time and should like to do it. The work could be simply questions without text or note, or with text and commentary with reference to Harkness, and Allen and Greenough, for Latin, and Goodwin and Hadley for Greek. Have you ever seen Taylor's Method of Classical Study? That is my ideal, but I should not think it advisable to be so critical as that except for opening chapters of books. I think I am competent to prepare such a book, and I think with your push and paper, it or they would make a good sale and fill an empty void. I am ready to

go right to work and make up a critical work. I have had some experience, having finished Kühner's Greek Grammar, incomplete at my father's death. Should this strike you favorably, I think it would turn out to your advantage as well as mine.

Yours, very truly,

GEORGE H. TAYLOR.

The proposition led to some further correspondence, which is thus suddenly terminated by his unexpected death.

It appears that he had not been feeling well for some time past, but had continued about his usual work, laboring hard, as the close of the term was approaching. On the morning in question Prof. Taylor ate a very light breakfast, and about ten o'clock went out with one of the students of the Academy to kill a dog, which it was feared was developing signs of hydrophobia. Having left the boys to complete this task, Prof. Taylor returned to the hall of the Academy building, and when he reached the door of the parlor he fell to the floor and soon after expired. Mrs. Taylor and Prof. Hunt, assistant teacher at the Academy, immediately went to his assistance, but he never recovered consciousness, and showed only slight signs of life. Medical aid was immediately summoned, but he was cold in death long before the physicians arrived. The cause of death was undoubtedly heart disease, which is hereditary in the family, Prof. Taylor's father and mother both having died from this cause; and, strange to relate, both died upon Sunday morning just before church time. Prof. Taylor had been a severe sufferer from rheumatism for some time past, and it was the opinion of the physicians that this had struck his heart, and aggravated the hereditary difficulty.

The *Daily Democrat*, to which we are indebted for much of this notice, remarks:

"He was an excellent and faithful teacher, and very popular with his scholars. Of fine physical form and development, and genial, whole-souled nature, he might well have been taken for a model of a true-hearted, christian gentleman. He was a consistent member of the Episcopal church, in which, at the time of his death, he was engaged in studying for holy orders, and had several times officiated as lay reader in St. Ann's church. As an instructor, a man and a christian, he will long be held in favorable remembrance by all who had the pleasure of his acquaintance, and of him it may be truly said:

'None knew him but to love him,
None named him but to praise.'"

VICE-CHANCELLOR CLINTON'S ADDRESS.

Gentlemen of the University Convocation :

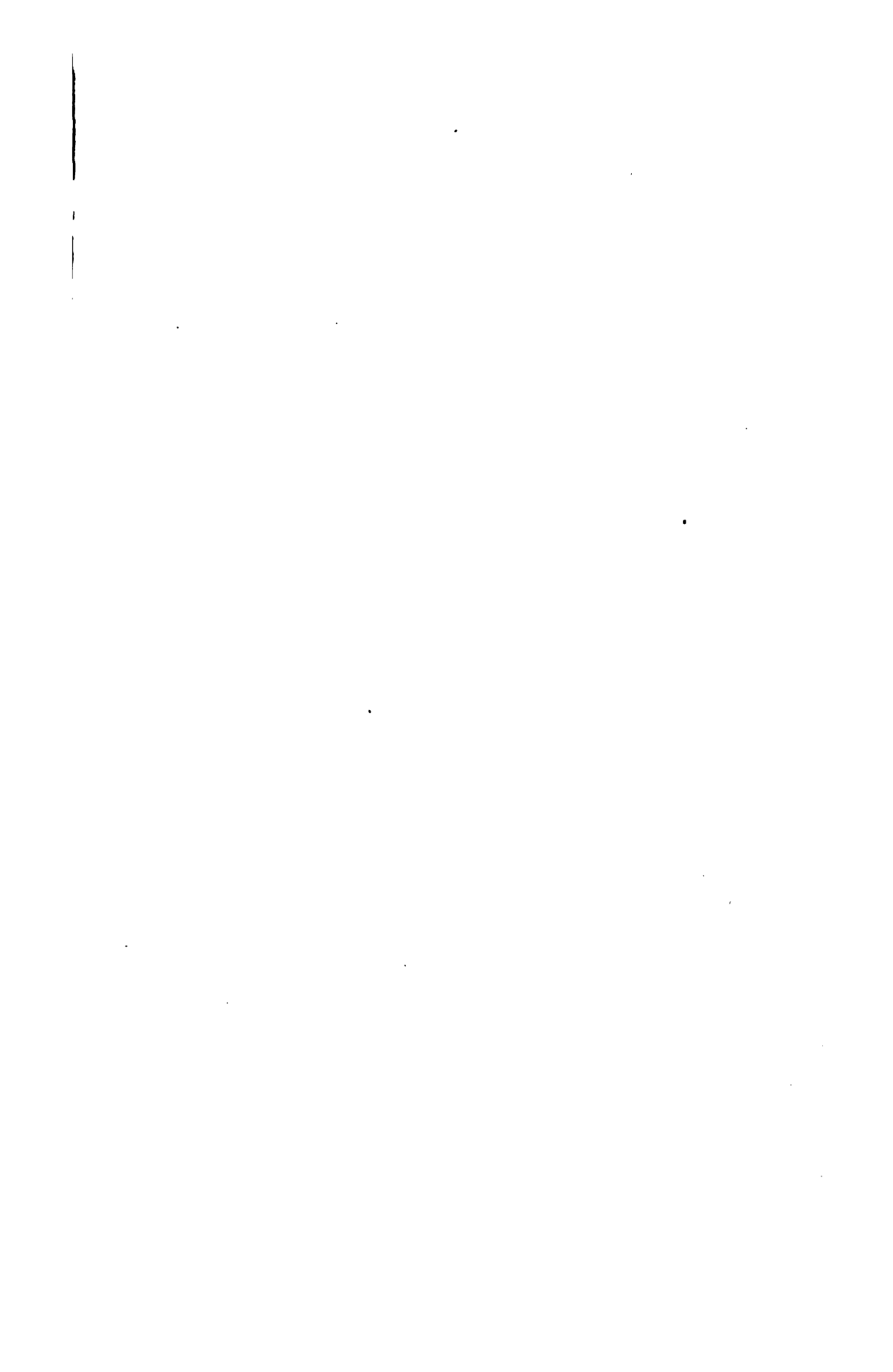
I never designed to inflict a set speech upon you, nor consented to play the orator in this august assemblage. Our excellent Chancellor, as our presiding officer, opened our session with most cheering statements, with wise suggestions, with intimations of the duty of educators and the promoters of education, which in this dark and anxious crisis in our history must have sunk deep into your hearts. It remains for me to discharge the duty he has devolved upon me of closing it, and I shall do so with a few reflections which, in part at least, if not suggested, must be colored by the deep feeling of suffering and anxiety in which, through the assassin's pistol, our widespread country stands. It is a consolation to know, what from the beginning I felt must be true, that the base assassin was isolated in the conception and perpetration of the crime, even as he must remain isolated in his eternal infamy. And yet the execrable crime, though for the moment it shook the world, and brought peculiar anguish to every true American, may, through God's great kindness, result in good. The recovery of the assailed will, we are sanguine, restore peace and happiness to his own family, and return a most worthy citizen and eminent statesman to the service of the state in his exalted office. But, however deplorable may be the result as respects our President and present public weal, the consequences can be but evanescent. Though the earth seemed to rock and all nature to stand aghast, the strong foundations of our government remain more solid than the everlasting hills, our institutions are all unshaken, our liberties are perfectly secure. But the very virtues and the pre-eminent position of the victim, draw our attention irresistibly to the lamentable facts that license will intrude upon the domains of liberty, that political corruption finds place in our free states, and that the lust of office and the love of plunder assume the mask of patriotism and honorable ambition. It is lamentably evident that public virtue does not keep pace with education. Never was education more general or more thorough throughout our country. Never was public virtue at a lower ebb. Never was vice more general or more pervasive in all its forms of brutality and fraud, and the vile Guiteau (as are a large proportion of the brutal criminals, and a very large proportion of the swindlers and violators of public and private trusts, in this country) is, in the ordinary sense of education, an educated man; and perhaps that fact may properly incite us to inquire whether our systems of education may not be made more roborant of virtue and more repressive of crime, and impel each of you upon whom rests the labor and who enjoy the rewards of the higher edu-

cation to ask yourselves whether you use to the utmost all the powers your profession gives you to truly educate your pupils. We feel, indeed, that mere learning, such as you impart, is somehow repressive of crime, and that secular education is promotive of public and private virtue. Knowledge is power, and gives us strength for evil as well as good. But education, in its true sense, deals with man in his tripartite totality. It is not a mere drawing out and strengthening of the intellect, nor a mere filling it with knowledge, but it is also a developer of the senses and of the strength flexures of the muscles and the body, and above all, its highest and holiest office is to guide the affections, exalt the sentiments, and purify and sublime the soul. A perfectly educated man is a perfected man — the only similitude of God upon the earth; the wholly uneducated man is scarcely superior to the brutes. It may well be — though neither my opportunities of observation nor my academic and college life of more than fifty years ago enable me to judge — that the teachers in our higher seats of learning might, in imparting knowledge, and without departing from the curriculum, without trenching upon the holy office of the priest, inculcate morality and heroism more effectually than they do by precepts, by homely illustrations, and by examples of heroic acts and sufferings drawn from history. If history be philosophy teaching by example, so is biography; and history, from the beginning until now, is full of glorious examples of virtuous acts and abnegations, of patriotic sacrifices, and of the perennial rewards they bring; full, too, of instances of crime and its punishments, and everywhere deformed by names doomed through it to eternal infamy; all the way down from Cain through Arnold and William Tweed to this detestable and contemptible Guiteau. A curriculum which excludes history is hardly to be commended; and the old doctrine that the teacher, in relation to his pupil, stands *in loco parentis*, requires that he should make himself the pupil's friend, indulge him so far as due discipline permits in social intercourse, advise as to his course of outside reading, and teach him the moral worth and grander uses of knowledge, and the true majesty of manhood. Pupils are of as fine a nature as yourselves, and have rights which deserve to be respected, and you, most worthy teachers, "are but children of a larger growth." There is indeed no royal road to learning, but her enjoyments are ecstatic, and the path to her, however rugged, can be made pleasant and inviting by the sympathy of our superiors and the friendly guidance of their hands. You are, I repeat, in the place of parents, and are bound to show yourselves the truest friends and the firm though gentle guides of the young freemen intrusted to your care. They are not helots; you are not their masters. They are not to be driven and lashed to the performance of their work. They are to be nurtured by and not crammed with knowledge, and while education should be eminently robust and practical, it should add beauty to strength and growth to vigorous power.

Believe me, my friends! I speak in great humility in expressing

my sad conviction that there is in the spirit of our time some danger that education may, in the general, be made too discursive for thoroughness; danger, too, that hypothesis may be accepted for theory, and that the common school, as well as our higher seminaries of learning, may be invaded and contaminated by that irreverent spirit which animates philosophy, falsely so called. It seems to me the spirit of that philosophy is like the pride of Lucifer, and that its efforts are as futile as those of the fabled Titans. They pile Pelion on Ossa in their vain attempts to scale cloudy Olympus. Like Milton's Satan, they struggle through chaos, a metaphysical abyss of contentious emptiness, and emerge at last only to be confronted by Death and Sin, by shapes of horror and despair. We may rest firmly on theory, but hypothesis is unproved guess — a probability more or less strong — the offspring of fancy — at best a provocative to inquiry. It ought to be presented, when presented at all, as hypothesis, and should never be permitted to usurp the place of science in our schools. And then if the hypothesis in vogue seems to tend to dead materialism, it is a plain duty to condemn and exclude it. There are limits to our intellectual capacity. Who by searching can find out God? He is boundless in his every attribute, and therefore is utterly incomprehensible by our finite intellect. But that He is, and that He is the ruler of the universe is as manifest as this beautiful world — this glorious revelation of Himself. Happy the man who, in spirit and in truth can call him Abba, Father! Righteousness is the only security of nations, and free institutions — prattle as we may about philosophy — cannot live except in the atmosphere of a pure religion.

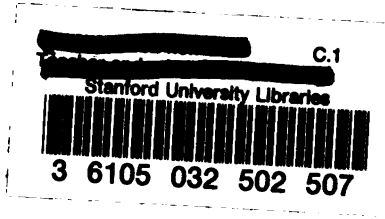
I cannot adequately express my appreciation of the dignity and worth of this Convocation. If I am happy in the contemplation of any of my scanty honors, it is that I pertain to it. If there be an act which I desire mentioned in an obituary notice of myself, it is the fact that I took some part in preparing the way for and in organizing the University Convocation of the State of New York. The fame of its scholars and scientists is a most precious property of the State, and I cannot look upon this assemblage and consider the character and standing of the members of our Convocation, without congratulating New York upon it wealth. How nobly has it subserved the avowed purposes of its foundation! It has brought the scattered elements of the University into friendly and profitable communion; it has advanced the standard of education throughout the State; it has co-operated most efficiently with the Regents and sustained them in their labors; it has exerted a direct, powerful and wholesome influence upon the people and the legislature; and it has, upon this occasion, exhibited a vigor which is full of promise for the future. Long may it continue to promote the happiness and honor of its members, to add to the jewels of the State, and to broaden and confirm the foundations of the liberties and true prosperity of our people.



CUBBERLEY LIBRARY

To avoid fine, this book should be returned on
or before the date last stamped below

--	--	--



CASEMENT

378.74

N537k

19th

1881

New York university.
Proceedings of the convocation.
19th, 1881.

DATE (STAMP)

SIGNATURE

NAME

CUBBERLEY LIBRARY

